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ERRATA

Vol. **13.** p. 116. U.S.A. (**1942**). **Report of the Secretary of Agriculture 1941.** For correct abstract of this report, see *V. B.* **13**, 198.

p. 117. RICHMOND *et al.* (1942), for "Increased activity, shown by increased toxicity and amplitude," read "Increased activity, shown by increased tonicity and amplitude."

p. 137. SCHAEFFER *et al.* (1942), for "the daily requirement of nicotinic acid was 200-225 mg. per kg. body weight, as compared with 250-365 mg. for growing animals," read "the daily requirement of nicotinic acid was 200-225 μg. per kg. body weight, as compared with 250-365 μg. for growing animals."

p. 143. THORP *et al.* (1942), for "total daily doses of 7·5 mg., 5 mg., 2 mg., 2 mg., and 1 mg., respectively," read "total daily doses of 7·5 g., 5 g., 2 g., 2 g., and 1 g. respectively."

NOTE:—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

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DISEASES CAUSED BY BACTERIA AND FUNGI

*CATAGNOLI, B. (1941). Ricerche batteriologiche su di una malattia degli equini riscontrata nella provincia di Foggia. **[Bacteriological Research on a Horse Disease in Foggia Province]**.—*R.C. Ist. Sanit. publ., Roma.* **4.** 444–453. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **141.** 457]. **1015**

Streptococcus pyogenes equi was isolated from the brain of a dead horse. The organism proved to be highly pathogenic for g. pigs by intracerebral inoculation.

SEELEMANN, M., & FLINT, A. (1942). Die Gruppe A der hämolytischen Streptokokken. **[Haemolytic Streptococci of Group A]**.—*Zbl. Bakt. I. (Orig.).* **149.** 129–141. **1016**

This is a review of the occurrence, pathogenic significance, and biological and serological characters of group A streptococci. The authors investigated one strain with the biological characters of group A strains but which fell into no known serological group. One strain of *Str. mucosus* was proved to belong serologically to group A.—D. L. ROBARTS.

ROSS, O. A. (1942). **The Use of Radioactive Phosphorus as a Tracer in Hemolytic Streptococci. I. Detection of Assimilated Radioactivity in Treated Fractions of Sonically Vibrated Organisms.**—*J. Immunol.* **44.** 329–336. **1017**

R. shows that inorganic radioactive P added to culture medium is assimilated by Lancefield group A haemolytic streptococci and that within the limits of the concentrations used ($6{\cdot}32 \times 10^{-12}$ to $8{\cdot}95 \times 10^{-10}$ g. per 800 ml. of medium) it had no effect on the type of the mass growth or on the colonial type of growth obtained. The radioactivity is detectable in an acid precipitate from the supernatant and in the "M" fraction of the sediment of sonically vibrated streptococci. The ratio, radioactive to total P, in the media as compared with that in the supernatant fraction, was found to average 2·04 over 15 estimations, which ranged from 3·95 to 0·46. When it was compared between media and "M" fractions it varied from 3·3 to 5·0 in four determinations.—E. J. M. HAYWARD.

*VAN DER SCHEER, A. F. (1941). Over mastitis veroorzakende Streptococcen. **[Streptococci Causing Mastitis]**.—*Proefschrift, Wageningen.* pp. 196. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **141.** 461]. **1018**

The author made an extensive study of the streptococci which cause mastitis. In the identification of the various species attention is drawn to the importance of Seelemann's "ball of string" colonies and to Diernhofer's slimy colonies in the appropriate media, as indicating *Str. agalactiae.* Nearly all strains of *Str. dysgalactiae* cause clouding of the serum agar underneath the colonies. Mastitis due to this organism occurs typically during the second half of the year and is relatively easily cured. *Str. uberis* is rarely met and is said to be less benign than is often stated.

The author divides the group C streptococci into two varieties—*Str. pyosepticus* var. *animalis* which ferments sorbite and *Str. pyosepticus* var. *humanus* which ferments trehalose. Mastitis caused by the former occurs during the first half of the year, but is rare. The latter is recoverable from cows' milk, but does not cause mastitis.

The following medium is recommended for cultural isolation of mastitis streptococci :– calf meat broth 1,000, peptone 10, NaCl 5, aesculin 1, and agar 25 parts at pH 7·4. Before use the medium is liquified by heat, cooled to 50–60°C. and 8–10% of horse serum is added.

DAVIS, J. G. (1941). **A Practical Index of Mastitis.**—*Dairy Indust.* **6.** 238–240 and 243. **1019**

This article deals with the importance of mastitis to the dairy industry, reference being made to the effect of mastitis on the yield, compositional quality, flavour, and keeping quality of milk, and on cheesemaking and other processing. The chemical changes induced in the milk as the result of mastitis are of significance from the industrial aspect and the properties chiefly affected are demonstrated by three tests :– (1) the catalase test which is the simplest method of estimating the cell content of the milk (including leucocytes, erythrocytes, tissue cells, and cell debris) and which indicates the physiological normality of the milk, (2) the rennet test which is an empirical method of estimating pH and casein : globulin ratio, mastitis milk having an increased pH and a longer clotting time than normal milk, and (3) the solids-not-fat test, the value of which is lower in mastitis milk than in normal milk. By means of these three tests colostrum, late lactation milk, and milk diluted with water can be distinguished as well as mastitis milk.

By giving points on a graded scale for varying degrees of reactivity to the three tests mentioned, D. attempts to establish an index which will be of value to the manufacturer, enabling the quality of any consignment of milk to be rapidly assessed.—N. S. BARRON.

SOLOWEY, M., SOLOTOROVSKY, M., & BUCHBINDER, L. (1942). **Studies on Microorganisms in Simulated Room Environments. VII. Further Observations on the Survival Rates of Streptococci and Pneumococci in Daylight and Darkness.**—*J. Bact.* **43.** 545–555. [For previous parts, see *V. B.* **12.** 617]. **1020**

The bactericidal action of daylight was tested on 15 strains of group A streptococci and three strains of pneumococci. Previous results were confirmed, and it appears that differences in survival rates are due largely to variations in average chain length. The larger chains are more resistant to daylight because a greater number

of cocci per chain must be destroyed before the chain fails to produce a colony.

There was no evidence that the "epidemic property" of certain strains was due to their ability to resist the action of daylight for long periods.—J. F.

HARMS, F. (1942). Pneumokokkeninfektionen bei Tieren. **[Pneumococcus Infection in Animals].**—*Z. InfektKr. Haustiere.* **58.** 160–170. **1021**

During the winter of 1940–41, 50 of 150 g. pigs died from pneumococcal infection in three months. There was a predominance of the type 19 pneumococcus. Nasal swabs from the g. pigs showed that from 60–75% of all animals were carriers. Animals bought in were swabbed and the carrier rate even in summer months was as high as 10% and this percentage rapidly rose when the animals were introduced into the highly infected group. Of three cats in the same room as the infected g. pigs one died of catarrhal pneumonia with sero-fibrinous peri- and epicarditis. Pneumococci were isolated but not typed.

H. describes two cases of pneumococcal infection in foals, associated with joint ill. Pneumococci were isolated which in the one case proved to be of type IV and in the other of type IX. A review is given of pneumococcal infections in animals, cases having been described not only in g. pigs but in calves, sheep, foals, and apes.—D. L. ROBARTS.

*MAZZA, G. (1941). Influenza del blocco dell'apparato reticolo istiocitario sulla recettività del pollo all'infezione carbonchiosa. **[Influence of Reticulo-Endothelial Blockade on Susceptibility of Fowls to Anthrax].**—*Nuovo Ercol.* **46.** 168–187. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 284]. **1022**

The reticulo-endothelial system of fowls was blockaded by intravenous injections of trypan blue and they were then given subcutaneous or intramuscular inoculations of anthrax broth culture. All survived.—M. L.

TOTIRE-IPPOLITI, P. (1942). Sulla resistenza e conservazione del virus carbonchioso in pezzi di organi disseccati. **[Viability of *Bacillus anthracis* in Desiccated Tissues].**—*Nuova Vet.* **20.** 94–95. **1023**

The spleen and pieces of liver from a g. pig which died of experimental anthrax were allowed to dry, at room temperature, in a Petri dish. Two years later the material contained viable anthrax spores.—M. WATSON.

*MAGNUSSON, H., & VEDEL, P. (1941). Fall av tuberkulos i späck och kött hos svin. **[TB. of the Fat and Flesh of a Pig].**—*Skand. VetTidskr.* **31.** 349–352. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 47]. **1024**

About 50 small abscesses were found in the fat and flesh along the back of a fat sow which was slaughtered. There were no lesions in the internal organs. Microscopic and cultural examination of the butter-like abscess pus gave negative results, but animal inoculation tests on g. pigs and a calf caused TB. of high virulence, whilst inoculation of a pig caused only a low-grade infection.

The abscesses probably originated from infected skin wounds.

*ĆEPULIĆ, V. (1940). **[Significance of Bovine Type TB. in Human Beings in Croatia].**—*Liječn. Vijesn.* **62.** 336–340. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 173]. **1025**

In Croatia, 2–5% of cows from small holdings react to the tuberculin test. The corresponding figures in the case of large herds are 30–50%.

Croatia is stated to be among the countries with the lowest incidence of bovine, and the highest incidence of human, TB.—M. LANDAU.

—. (1942). **Medical Research Council. Report of the Committee on Tuberculosis in War-Time.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 246. pp. 36. **1026**

Since the beginning of the war, the mortality from non-respiratory forms of TB. in man has increased considerably. As about 30% of such forms of TB. are due to infection from cattle, the pasteurization of all milk is advocated.—D. D. OGILVIE.

WOODRUFF, C. E., & KELLY, R. G. (1942). **The Correlation between Anatomical Changes and the Allergic State in Tuberculous Guinea Pigs.**—*J. Immunol.* **45.** 79–85. **1027**

206 g. pigs inoculated with 0·1 mg. of virulent tubercle bacilli (human type) were skin tested at intervals of 2–3 weeks (or less as they approached death) in order to follow changes in their skin sensitivity. Skin tests were carried out with tuberculin in tenfold dilutions ranging from 1 : 10 to 1 : 10,000 O.T.

After infection the skin sensitivity rose, but as the disease developed it frequently became much lower again. Those animals in which it became lowest usually showed extensive pulmonary lesions teeming with acid-fast bacilli, absence of caseation in the pulmonary lesions, epithelioid infiltration through the pulp of the spleen, and frequently infarction of that organ. The animals with the higher degrees of skin sensitivity showed few or no acid-fast bacilli in their pulmonary lesions even when these were caseous.—E. J. M. H.

UNGAR, J. (1942). **The Golden Hamster as a Test Animal for Tubercular Infection. [Correspondence].**—*Nature, Lond.* **150.** 432. **1028**

The Syrian or golden hamster (*Cricetus auratus*, develops a tissue reaction to intramuscular or intraperitoneal injection of human or bovine strains of *Mycobacterium tuberculosis*, similar to that of g. pigs. Macroscopic lesions sufficient for diagnosis develop in 16–20 days. The available stock of hamsters in Great Britain is highly inbred and has a genetic uniformity suitable for biological tests. Other considerable advantages are detailed.—C. V. WATKINS.

VAN DEINSE, F. (1942). Action pathogène pour le cobaye de quelques cultures de bacilles tuberculeux bovins au cours de passages successifs sur pomme de terre biliée. Importance de la voie d'inoculation. **[Pathogenicity for G. Pigs of Bovine Type Tubercle. Bacilli during Passage on Potato Bile Medium. Importance of Inoculation Route].**—*Ann. Inst. Pasteur.* **68.** 271–273. **1029**

Virulent bovine strains of *Mycobacterium tuberculosis* were attenuated by repeated subculture on bile potato medium. After 50–100 passages, the bacilli lost their virulence for g. pigs on subcutaneous inoculation, even when the dose was as large as 2 mg. The same cultures injected intravenously or intracardially caused death of the g. pigs in less than 30 days. P.M. features were those of the Yersin type of TB. The spleen was enlarged, and there was congestion of the lungs, liver, and suprarenal l.nn. In some cases the liver was covered with a fine network of yellowish spots. Microscopic examination of the lungs revealed a diffuse histio-leucocytic infiltration of the alveolar walls, congestion, and oedema of the alveoli. Tubercle bacilli were rarely found.

Control experiments demonstrated the fact that these effects were not due to the action of the bile medium on which the bacilli were grown.—I. W. B.

BERTRAND, I., & BABLET, J. (1942). Sur l'inoculation intracérébrale de bacilles tuberculeux et paratuberculeux chez les singes inférieurs. **[On Intracerebral Inoculation of Tubercle and Paratubercle**

Bacilli into the Lower Monkeys].—*Ann. Inst. Pasteur.* **68.** 175–201. **1030**

Intracerebral inoculation of young monkeys (*Papio papio*) was found to be unsuitable for the differentiation of mammalian strains of tubercle bacilli. Both human and bovine strains caused a diffuse inflammation of the major part of the inoculated hemisphere, characterized by infiltration with polynuclear neutrophile leucocytes. The reaction to injection of avian strains, however, was much less severe. It was localized around the needle track, and characterized by histio-lymphocytic infiltration.

Intracerebral inoculation of suspensions of *Mycobacterium phlei* and BCG vaccine did not cause any infection, and there was no local trace of the inoculation after six months.—Isobel W. Burton.

*Kiørboe, F. (1941). Untersuchungen über die Dissoziation von Tuberkelbazillen des bovinen Typus. [**Dissociation of Bovine Type Tubercle Bacilli**].—*Z. Tuberk.* **87.** 157–164. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 27]. **1031**

The experiments reported show that variations in the virulence of bovine type tubercle bacilli occur in the various colonies of a single culture preparation and also in daughter colonies produced from a single primary colony.

This result confirms Petroff's views on the dissociation of the tubercle bacillus.

Levaditi, J. C. (1942). Bacille de Koch et ultrafiltration. [*Mycobacterium tuberculosis* **and Ultrafiltration**].—*Ann. Inst. Pasteur.* **68.** 168–173. **1032**

Cultures, 21 days old, of human tubercle bacilli on Löwenstein's medium were dried, and emulsified in Hartley's broth in a concentration of 0·25 mg. in 1 ml. of broth. The emulsions were filtered through gradocol membranes. The filtrates were examined for tubercle bacilli by means of stained smears, culture, and animal inoculation. After the ultrafiltration, the gradocol membranes were sectioned, and the disposition of the tubercle bacilli in them was studied.

All membranes of average pore diameter of 1,040 mμ or over allowed tubercle bacilli to pass through. Membranes with a pore diameter of 930–720 mμ allowed bacilli to pass through in only one case out of three. Membranes with a pore diameter of less than 720 mμ retained all pathogenic elements.

Tubercle bacilli were seen in stained sections of the membranes with a pore diameter of 1,140 mμ or over, but not in the finer membranes.—I. W. Burton.

*Laporte, R., & Bretey, J. (1941). Sur la libération de particules non acido-résistantes par les cultures de bacilles tuberculeux mises en suspension dans une huile minérale. [**Liberation of Non-Acid-Fast Particles by Cultures of Tubercle Bacilli in Mineral Oil**].—*C. R. Soc. Biol. Paris.* **135.** 169–171. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 27]. **1033**

Dried tubercle bacilli were suspended in liquid paraffin, incubated for three days at 37°C., and then centrifuged for two hours at 6,000 r.p.m., the bacilli then being deposited. The liquid paraffin had assumed a yellowish brown tint and was slightly cloudy. By smear preparations it was determined that the paraffin contained many bacilli staining by the Ziehl-Neelsen method as well as numerous blue-stained bodies, which were not acid fast.

These bodies could be collected by further high-speed centrifugation. Their significance is discussed.

I. *Saenz, A. (1941). Caractères d'un bacille acido-résistant isolé des ganglions cervicaux d'une souris. [**Morphological Characters of an Acid-Fast Bacillus Isolated from the Neck Lymph Nodes of a Mouse**].—*C. R. Soc. Biol. Paris.* **135.** 320–322. **1034**

II. *Saenz, A. (1941). Identité de caractères du bacille de la souris et du bacille parasite du cobaye neuf. Différenciation de ce type de bacille d'avec le bacille aviaire lisse S avirulent. [**Identity of Acid-Fast Bacillus from Mice and G. Pigs and its Differentiation from Avirulent S Avian Tubercle Bacilli**].—*Ibid.* 323–325. **1035**

[Absts. from absts. in *Zbl. Bakt. I.* (*Ref.*). **142.** 28 & 29].

I. A description of the appearance of colonies on and in various media of acid-fast bacilli isolated from enlarged neck lymph nodes of a mouse. The organism was of low pathogenicity for mice and g. pigs.

II. Acid-fast bacilli have been isolated at various times from the spleens of apparently healthy g. pigs and mice. The bacilli behave identically in culture media and in their low pathogenic effects. [Presumably these two abstracts refer to the same organism.]

*Spanedda, A. (1941). Su di un paratubercolare del furetto. [**Paratuberculosis of Ferrets**].—*G. Batt. Immun.* **26.** 405–408. [Translation of abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 471]. **1036**

S. isolated a species of *Mycobacterium* from a naturally infected ferret. It grew on the usual culture media and was pathogenic and tuberculogenic in g. pigs, but not in rabbits. The name *Mycobact. mustelae* is proposed.

Urbain, A., Thiery, J. P., & Courtade, R. (1942). Sur la conservation du bacille morveux desséché sous le vide après congélation. [**Conservation of** *Pfeifferella mallei* **dried** *in vacuo* **after Freezing**].—*Ann. Inst. Pasteur.* **68.** 159–161. **1037**

Emulsions of *P. mallei* in gum arabic solution were solidified by refrigeration and dried rapidly under a vacuum. The sealed ampoules containing the dried bacilli were then stored in the dark, one lot at room temperature and a second at 5°C. In both cases, virulence was retained for eight months after drying, but was lost at nine months. Vitality was retained for nine months and all cultures, with one exception, were dead at ten months.—Isobel W. Burton.

Schoop, G., & Kauker, E. (1942). Die Geflügelcholera im Warthegau. [**Fowl Cholera in Wartheland**].—*Dtsch. tierärztl. Wschr.* **50.** 161–167. **1038**

An extensive analysis of the incidence of fowl cholera in Wartheland. 37·2% of all farms examined were infected. Mortality is very high, the top of the curve being in November while in May, June and July the incidence is lowest. Vaccine alone or vaccine given simultaneously with serum is used in combating the disease; protection conveyed by vaccine alone is not in all cases sufficient.—Tj. Bakker.

Canham, A. S., & Haig, D. A. (1942). **Wattle Disease: A Form of Chronic Fowl Cholera in Natal.**—*J. S. Afr. vet. med. Ass.* **13.** 25–26. **1039**

Outbreaks of wattle disease in fowls due to *Pasteurella aviseptica* have been previously described from Australia and California. In this article an outbreak is described which occurred on a farm in Natal. Cock birds were mainly affected and only when kept in pens. The swollen wattles contained thick yellow pus which, when inoculated into rabbits, caused death in less than 24 hours. Cultures from the heart blood developed colonies of a bipolar organism with the cultural and morphological characters of *Past. aviseptica*. Cultures could not be obtained directly from the pus and those obtained from the rabbit tended to die out quickly. Removal of the comb and wattles was found to be the best form of treatment and the best preventive

method. Infection apparently occurred through small wounds of the wattle acquired from mash hoppers with sharp edges.—E. M. ROBINSON.

PHILIP, C. B. (1939). **Tularaemia in Alaska.**—*Proc. 6th Pacif. Sci. Congr., 1939.* **5.** 71–73. **1040**

A record of the finding of *Past. tularensis* in *Haemaphysalis leporis-palustris* ticks from hares at Fairbanks, Alaska. One unconfirmed human case is referred to. —J. E.

JELLISON, W. L., KOHLS, G. M., BUTLER, W. J., & WEAVER, J. A. (1942). **Epizootic Tularemia in the Beaver,** *Castor canadensis,* **and the Contamination of Stream Water with** *Pasteurella tularensis.*—*Amer. J. Hyg.* **36.** 168–182. **1041**

An outbreak is described of tularaemia in beavers in Montana in 1939–40. In a few cases field mice living near streams were also infected. Four streams were shown to be contaminated with *Past. tularensis.* Contamination persisted for at least 33 days after all beavers had died. The origin of the outbreak was obscure. —D. D. OGILVIE.

NETER, E. (1942). **The Genus Shigella (Dysentery Bacilli and Allied Species).**—*Bact. Rev.* **6.** 1–36. **1042**

An account is given of the morphological, cultural, and biochemical characteristics of the genus *Shigella,* together with a description of methods of isolation, serological identification, and specific therapy of associated diseases. A detailed classification is made of the genus into four groups according to biochemical tests. Each species included in a comparative classification of the true dysentery bacilli according to six different authors is considered in turn, with regard to pathogenicity, antigenic structure, and fermentation reactions. The extension of investigations of specific growth requirements, antigenic structure, and pathogenicity to include all members of the genus is advocated by N. An excellent bibliography is appended. —R. O. MUIR.

STUART, C. A., ZIMMERMAN, A., BAKER, M., & RUSTIGIAN, R. (1942). **Eijkman Relationships of the Coliform and Related Bacteria.**—*J. Bact.* **43.** 557–572. **1043**

The authors examined a large number of coliform and related organisms for their ability to grow, to produce acid, or to produce gas in a modified Eijkman medium containing either lactose or glucose at 45·5°C. Their results indicate that the ordinary biochemical activities, particularly the production of gas from carbohydrates, of the different genera of the family Enterobacteriaceae tend to increase from *Serratia* through *Erwinia* to *Aerobacter,* then to decrease through *Escherichia, Proteus,* and *Salmonella* to *Shigella.* A similar condition appears to be true for the Eijkman reactions of these genera.

In the coliform group, including aberrant coliforms, there is a large temperature range in which these organisms may grow and produce acid and gas in lactose or glucose. This extends from some pseudomicroaerogenic type 2 cultures which produce acid and gas vigorously at 20°C., but do not show any visible growth in broth pre-heated to 37°C., through the Aerobacters, which produce acid and gas at 37°C. but vary in their reactions at 45·5°C., to the great majority of *Escherichia* which produce acid and gas more rapidly and abundantly at 45·5°C. than at 37°C.

A simplified grouping of coliform organisms is suggested.—E. J. M. HAYWARD.

ROMBOLI, B. (1942). Le malattie di allevamento nei camelidi. Su di una enzoozia di natura colibacillare nei neonati della mandria della R. ed I. Tenuta di S. Rossore (Pisa). [**Enzootic** *Bacterium coli* **Infection in Newborn Camels**].—*Nuova Vet.* **20.** 85–93. **1044**

R. describes a disease of newborn camels which occurred in Pisa. The disease resembled the neo-natal coliform septicaemia of other domestic animals, but the intestinal form, causing diarrhoea and dysentery, was the common one. The organism concerned was *Bact. coli.*

Descriptions and illustrations are given of degenerative changes in the internal organs.—MILLER WATSON.

KAUFFMANN, F. (1941). Die Bakteriologie der Salmonella-Gruppe. (Typhus-Paratyphus-Enteritis-Gruppe). [**Bacteriology of the Salmonella Group**]. pp. 393. Copenhagen: Einar Munksgaard. [8vo]. **1045**

The subcommittee (of the Nomenclature Committee of the International Association of Microbiologists) on the genus *Salmonella* reported in 1939 in New York [*V. B.* **11.** 427.] a revised antigenic scheme of the genus *Salmonella.* Certain types were omitted as they were considered merely antigenic or cultural variants, *e.g.* the non-specific variants of *S. typhimurium* and *S. cholerae-suis* and the cultural variant of *S. gallinarum* (*S. pullorum*). The antigenic phases of the "H" antigens were to be known as Phase 1 and Phase 2 and the definition of the group was modified, stressing the fundamental importance of serological criteria. This latter was necessary because of cultural exceptions, for *S. eastbourne* forms indole, *S. dar es salaam, S. schleissheim,* and *S. abortus-bovis* liquefy gelatin, and a variant of *S. anatum* ferments lactose. In virtue of the fact that there are now known to exist five types of *Bacterium coli* which possess antigens of the group, K. suggests that the definition of the salmonella group should now read as :– "Salmonella bacteria are Gram-negative bacteria which, on the grounds of their antigenic structure, fall into the Kauffmann-White Scheme".

K. proceeds to describe the methods employed for cultural differentiation of the group dealing with the ammonia weak and ammonia strong types, those which ferment rhamnose rapidly and ferment organic acids, and those which react in glycerin-fuchsin-broth. The chapters on serological typing give a complete description of the methods employed for the production of antisera and the identification of the different antigens (H, O, and Vi). A brief account is given of the M antigen which is associated with mucoid variants of the group. This has been studied with living and formalized bacteria and after heating to 60°C. The antigen is apparently destroyed by alcohol and HCl and by heating to 100°C., although after the last treatment it is still capable of combining with its antibody. K. discusses the three types of typhoid bacilli, the V form in which the Vi antigen is present and the O inagglutinable, the W form in which the Vi antigen is absent and the O is agglutinable, and the VW form in which the Vi antigen is present but nevertheless the O antigen is agglutinable. This may be complicated by smooth and rough forms, the former possessing the O antigens with and without Vi antigens and the latter having no O antigen with or without the Vi antigen. A table is given of the antigenic structure of 107 salmonella types including the five known as *S. coli* 1 to 5. The Vi antigen may occur in *S. typhi, S. paratyphi* C, *S. ballerup,* and *S. coli* 1.

The different methods employed for the isolation of salmonella are described and the way in which concentration of salmonella in natural materials is brought about. Brief accounts are given of each salmonella and their pathological significance; of special interest is a brief record of the work of EDWARDS & BRUNER on the three phases which *S. abortus-equi* may exhibit.

Kauffmann–White–Scheme 1940

	Type	O–Antigen	H–Antigen Phase 1	H–Antigen Phase 2
		A–B Groups		
1.	*S. paratyphi* A	[I]. II. XII...	a	—
2.	*S. paratyphi* B	[I]. IV. [V]. XII...	b	1, 2...
3.	*S. abony*	[I]. IV. V. XII...	b	e, n, x...
4.	*S. typhi-murium*	[I]. IV. [V]. XII...	i	1, 2, 3...
5.	*S. stanley*	IV. V. XII...	d	1, 2...
6.	*S. heidelberg*	IV. V. XII...	r	1, 2, 3...
7.	*S. chester*	IV. [V]. XII...	e, h	e, n, x...
8.	*S. san diego*	IV. [V]. XII...	e, h	e, n, z_{15}...
9.	*S. saint paul*	I. IV. V. XII...	e, h	1, 2, 3...
10.	*S. zagreb*	IV. V. XII...	e, h	1, 2...
11.	*S. kaposvar*	IV. V. XII...	e, (h)	1, 5...
12.	*S. reading*	IV. XII...	e, h	1, 5...
13.	*S. derby*	[I]. IV. XII...	f, g...	—
14.	*S. essen*	IV. XII...	g, m...	—
15.	*S. budapest*	I. IV. XII...	g, t...	—
16.	*S. california*	IV. XII...	g, m, t...	—
17.	*S. brandenburg*	IV. XII...	l, v	e, n, z_{15}...
18.	*S. bispebjerg*	I. IV. XII...	a	e, n, x...
19.	*S. abortus-equi*	IV. XII...	—	e, n, x...
20.	*S. abortus-ovis*	IV. XII...	c	1, 6...
21.	*S. arechavaleta*	IV. [V]. XII...	a	1, 7...
22.	*S. altendorf*	IV. XII...	c	1, 7...
23.	*S. abortus-bovis*	[I]. IV. XXVII. XII...	b	e, n, x...
24.	*S. bredeney*	I. IV. [XXVII]. XII...	l, v	1, 7...
25.	*S. schleissheim*	IV. XXVII. XII...	b, z_{12}	—
		C Group		
26.	*S. paratyphi* C	VI_1. VI_2. VII... [Vi]	c	1, 5...
27.	*S. cholerae-suis* 1	VI_1. VII...	c	1, 5...
28.	*S. cholerae-suis* 2	VI_2. VII...	c	1, 5...
29.	*S. typhi-suis*		c	1, 5...
30.	*S. thompson*		k	1, 5...
31.	*S. virchow*		r	1, 2, 3...
32.	*S. oranienburg*		m, t...	—
33.	*S. potsdam*	VI_1. VI_2. VII...	l, v	e, n, z_{15}...
34.	*S. bareilly*		y	1, 5...
35.	*S. hartford*		y	e, n, x...
36.	*S. mikawashima*		y	e, n, z_{15}...
37.	*S. montevideo* 1		g, m, s...	—
38.	*S. montevideo* 2	VI_1. VII...	g, m, s...	—
39.	*S. oslo*	VI_1. VI_2. VII...	a	e, n, x...
40.	*S. amersfoort*	VI_1. VI_2. VII...	d	e, n, x...
41.	*S. braenderup*	VI_1. VI_2. VII...	e, h	e, n, z_{15}...
42.	*S. newport*		e, h	1, 2, 3...
43.	*S. kottbus*		e, h	1, 5...
44.	*S. bovis morbificans*		r	1, 5...
45.	*S. muenchen*		d	1, 2...
46.	*S. oregon*	VI_1. VIII.	d	1, 2, 3...
47.	*S. manhattan*		d	1, 5...
48.	*S. narashino*		a	e, n, x...
49.	*S. glostrup*		z_{10}	e, n, z_{15}
50.	*S. litchfield*		l, v	1, 2, 3...
51.	*S. duesseldorf*		z_4, z_{24}	—
		D Group		
52.	*S. typhi*	IX. XII... [Vi]	d	—
53.	*S. enteritidis*	[I]. IX. XII...	g, m...	—
54.	*S. dublin*	I. IX. XII...	g, p...	—
55.	*S. rostock*	I. IX. XII...	g, p, u...	—
56.	*S. moscow*	IX. XII...	g, q...	—
57.	*S. blegdam*	IX. XII...	g, m, q...	—
58.	*S. berta*	IX. XII...	f, g, t...	—

Kauffmann–White–Scheme 1940—*continued*

Type	O–Antigen	H–Antigen Phase 1	H–Antigen Phase 2
	D Group—continued		
59. *S. eastbourne*	[I]. IX. XII...	e, h	1, 5...
60. *S. sendai*	[I]. IX. XII...	a	1, 5...
61. *S. onarimon*	I. IX. XII...	b	1, 2...
62. *S. dar es salaam*	I. IX. XII...	l, w	e, n...
63. *S. goettingen*	IX. XII...	l, v	e, n, z_{15}...
64. *S. panama*	I. IX. XII...	l, v	1, 5...
65. *S. gallinarum*	IX. XII...	—	—
	E Group		
66. *S. london*	III. X. XXVI.	l, v	1, 6...
67. *S. give*		l, v	1, 7...
68. *S. uganda*		l, z_{13}	1, 5...
69. *S. anatum*		e, h	1, 6...
70. *S. muenster*		e, h	1, 5...
71. *S. nyborg*		e, h	1, 7...
72. *S. vejle*		e, h	1, 2, 3...
73. *S. amager*		y	1, 2, 3...
74. *S. zanzibar*		k	1, 5...
75. *S. shangani*		d	1, 5...
76. *S. meleagridis*		e, h	l, w
77. *S. lexington*		z_{10}	1, 5...
78. *S. newington*	III. XV.	e, h	1, 6...
79. *S. selandia*		e, h	1, 7...
80. *S. new brunswick*		l, v	1, 7...
81. *S. illinois*		z_{10}	1, 5...
82. *S. senftenberg*	I. III. XIX.	g, s, t...	—
83. *S. niloese*		d	z_4...
	Further Groups		
84. *S. aberdeen*	XI.	i	1, 2, 3...
85. *S. rubislaw*	XI.	r	e, n, x...
86. *S. poona*	XIII. XXII.	z...	1, 6...
87. *S. borbeck*	XIII. XXII.	l, v	1, 6...
88. *S. worthington*	I. XIII. XXIII.	l, w	z...
89. *S. wichita*	I. XIII. XXIII.	d	—
90. *S. habana*	I. XIII. XXIII.	f, g...	—
91. *S. carrau*	VI. XIV. XXIV.	y	1, 7...
92. *S. onderstepoort*	(I). VI. XIV. XXV.	e, (h)	1, 5...
93. *S. hvittingfoss*	XVI.	b	e, n, x...
94. *S. gaminara*	XVI.	d	1, 7...
95. *S. kirkee*	XVII.	b	1, 2...
96. *S. cerro*	XVIII.	z_4, z_{23}, z_{25}	—
97. *S. kentucky*	(VIII). XX.	i	z_6...
98. *S. minnesota*	XXI. XXVI.	b	e, n, x...
99. *S. tel-aviv*	XXVIII.	y	e, n, z_{15}...
100. *S. ballerup*	XXIX. [Vi].	z_{14}	—
101. *S. urbana*	XXX.	b	e, n, x...
102. *S. coli* 1	XXXI. [Vi].	.	1, 5...
103. *S. coli* 2	XXXII.	.	1, 5...
104. *S. coli* 3	IV. V. XII...	z_{20}	.
105. *S. coli* 4	IV. [XXVII]. XII...	z_{21}	.
106. *S. coli* 5	(I). VI. XIV. XXV.	z_{22}	.
107. *S. arizona*	XXXIII.	z_4, z_{23}, z_{28}	—

Key :– [ ] = these antigens may be absent.
( ) = only a part of the antigen present.
— = none present.
... = greatly shortened formulae.
. = not closely examined.

The final chapters deal with the pathogenesis and epidemiology of salmonella infections and their control. Attention is paid to the animal reservoirs and it is recorded that in the opinion of P. R. EDWARDS, poultry constitute the greatest reservoir of infection among the domestic animals in the U.S.A.

In spite of this record of work on the salmonella, the bulk of which has been done within recent years, there are many fields still unexplored and K. considers the following worthy of attention.

The study of the complete antigenic formulae of all the types; only those of diagnostic value are at the moment known. The isolation and immunological significance of the "partial antigens" and the different serological variations and phases to which the strains are subjected. The association between the antigens of the salmonella, coli, and dysentery groups of bacteria. The question of the toxins of salmonella and the chemistry of their antigens.—R. LOVELL.

POHL, G. (1942). Beitrag zur Verbreitung der Paratyphus-Enteritisbakterien in Ostpreussen. **[The Incidence of Salmonella Bacteria in East Prussia].** —*Tierärztl. Rdsch.* **48.** 110–112. **1046**

An analysis of the results over the last six years of routine bacteriological examination for salmonella during meat inspection at Königsberg. The most frequently isolated organism was *S. enteritidis* (Gaertner-Kiel), followed by *S. typhi-murium*. The incidence of salmonella isolations is falling, and possible reasons for this are suggested. A sketch-map shows the incidence and distribution of the two named organisms in the province of East Prussia.—E. COTCHIN.

RUBIN, H. L., SCHERAGO, M., & WEAVER, R. H. (1942). **The Occurrence of *Salmonella* in the Lymph Glands of Normal Hogs.**—*Amer. J. Hyg.* **36.** 43–47. **1047**

Lymph nodes of 40 groups, each composed of 25 normal pigs passed by the local veterinary inspector for human consumption, and of 50 similar individual pigs, were examined in Lexington, Kentucky. Salmonella were recovered from 19 of the 40 groups (47·5%) and from five of the 50 individuals (10%). From these, 242 strains were isolated which yielded 13 species of *Salmonella*, two, *S. lexington* and *S. oregon*, being previously undescribed. Lymph node from one group yielded three types of organism, five groups and one individual each yielded two types, and the remainder single types. *S. typhi-murium* was isolated from seven samples, *S. cholerae-suis* var. *kunzendorf* and *S. oregon* each from four samples, *S. anatum* and *S. give* each from three samples, *S. bareilly*, *S. derby* and *S. new brunswick* each from two samples and *S. bredeney*, *S. enteritidis*, *S. lexington*, *S. newington* and *S. worthington* each from one sample.—E. J. M. HAYWARD.

HANSEN, A. C. (1942). Die beim Hausgeflügel in Dänemark festgestellten Salmonellatypen. **[Salmonella Types Found in Poultry in Denmark].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 222–235. **1048**

An analysis of the salmonella types isolated from poultry during the period 1934–38.

Of the types isolated from the 308 cases, three were found to be *S. essen* and two *S. dublin*, the rest being *S. typhi-murium*.—TJ. BAKKER.

SCHOLES, J. C. (1942). **Experiments with X-rays on the Roles of Lymphocytes and Body Temperatures in the Resistance of Chicks to Salmonella Pullorum.** —*Poult. Sci.* **21.** 561–565. **1049**

Thirty-four 6-day-old chicks were exposed to 360 r. units of X-ray. The chickens were then divided into two groups. One group was brooded at 35°C. from the 6th–10th day and at 32°C. from the 10th–13th day. The other was brooded at 28°C. from the 6th–13th day.

Untreated control chicks were brooded with treated chicks. Rectal temperatures taken during the first six days of life did not differ significantly. On the second, third, and fourth days following X-ray treatment, the temperature of treated chicks was lower than that of the control chicks. This was particularly evident in the chickens brooded at 28°C. When examined 7–14 days after X-ray exposure, there was evidence of damage to liver cells and intestinal epithelium.

The authors consider it likely that the increased susceptibility to *S. pullorum* which follows exposure to X-rays is due to reduced body temperature and tissue damage rather than to reduction in the number of lymphocytes, a hypothesis put forward by ROBERTS, SEVERENS & CARD [*V. B.* **10.** 739].—F. D. ASPLIN.

BUNYEA, H. (1941). **Developing More Efficiency in the Operation of the Pullorum-Control and Eradication Phase of the Plan.**—*Conf. nat. Poult. Improvement Plan, 1941.* pp. 127–131. Discussion pp. 131–132. Washington, D.C.: U.S. Dep. Agric. **1050**

B. summarizes the great strides which pullorum disease activities have taken, the number of birds tested having increased from 2 million in 1936 to 10½ million in 1941; he points out the obvious beneficial effects the control plan has had on chick livability as shown by the fact that the mortality of chicks produced by hatcheries under the National Poultry Improvement Plan was 3·47% lower than in chicks from other sources. Various means are suggested by which the pullorum-disease control phase of the plan could be made more efficient.—R. F. GORDON.

—. (1941). **Twenty-first Annual Report on Eradication of Pullorum Disease in Massachusetts by the Poultry Disease Control Laboratory.**—*Control Bull. Mass. agric. Exp. Sta.* No. 108. pp. 11. **1051**

Results are reported of the pullorum disease testing for the 1940–41 season. Of the 527,328 birds tested, 492,475 were from non-reacting flocks, and among the 210 flocks tested for three or more consecutive years, 206 were non-reacting and represented 77% of all birds tested. The average percentage of infection (0·09) was the lowest in testing history, and the results indicate a progress in the establishment and maintenance of flocks free from pullorum disease. Only five breakdowns were encountered, one being traced to "custom hatching" and one to the feeding of garbage. In the other three cases the source of infection could not be determined, but the amount of infection detected was very small in all these flocks.—R. F. GORDON.

BORNSTEIN, S., & SAPHRA, I. (1942). **The Occurrence of Unusual Salmonella Species.**—*J. infect. Dis.* **71.** 55–56. **1052**

This is a description of the recovery from human cases of eight *Salmonella* species rarely found infecting man. Six of the species had previously been found in animals only, namely, *S. saint paul*, *S. worthington*, *S. eastbourne*, *S. manhattan*, *S. urbana*, and *S. senftenberg*.—M. H. KYAW.

EDWARDS, P. R., & BRUNER, D. W. (1942). **Two New Salmonella Types with Related Specific Antigens.**—*J. Immunol.* **44.** 319–324. **1053**

S. amherstiana, isolated from poults and *S. javiana*, isolated from a child affected with gastro-enteritis and from normal human carriers were shown to contain antigen 1 in their specific phases. An antigenic analysis of the two reveals their antigenic structure as (VIII): 1, (v): ...—1, 6... and [I], IX, XII...: 1, z_{28}: ...—1, 5... respectively.—M. H. KYAW.

EDWARDS, P. R., & BRUNER, D. W. (1942). **A Description of an Unusual Salmonella Type with Special Reference to the Evolution of Salmonella Species.** *J. Bact.* **44.** 289–300. **1054**

A new salmonella type, *S. salinatis*, is described. Its antigenic composition is more complex than that of any other salmonella previously described, its formula being IV, XII ... : d, e, h—d, e, n, z_{15}. Growth of this organism on semi-solid agar containing agglutinating serum for *S. typhi* resulted in the isolation of an organism having the antigenic formula IV, XII ... : e, h—e, n, z_{15} and being indistinguishable biochemically or serologically from the San Diego type. No reversion to the original type or further change could be induced in this organism.

The bearing of these and previous observations on White's theory of salmonella phylogeny is discussed. —E. J. M. HAYWARD.

HOHN, J., & HERRMANN, W. (1941). Ammonnährboden oder Methode nach Bitter, Weigmann, Habs in der Diagnostik der Typhus-Paratyphus-Enteritis-Gruppe? **[Comparison of the Ammonia Medium and the Method of Bitter, Weigmann and Habs in the Diagnosis of Salmonella Infection].**—*Zbl. Bakt. I.* (*Orig.*). **148.** 47–58. **1055**

In a comparative study of the reliability of Bitter, Weigmann & Habs' method (1926) and the authors' ammonia medium (1940) in the type identification of salmonella, the former method was not found to be suitable. The authors consider that their ammonium medium is suitable. Investigations were carried out on 52 strains.—J. CSONKA.

ROTHFUSS, W. (1942). Zur Herstellung spezifischer Salmonella-Seren. **[The Preparation of Specific Salmonella Sera].**—*Zbl. Bakt. I.* (*Orig.*). **148.** 174–179. **1056**

Details are given of the preparation of specific sera for the identification of salmonella and the methods used are described. Sven Gard's method and a similar method using broth media instead of agar gave satisfactory results.—J. CSONKA.

*VAN DER HOEDEN, J. (1940). De toepassing van het verschijnsel der phagocytose bij de diagnostiek der Brucellosen. I. Het gebruik van citraat en liquoid. II. De "tropine-reactie". **[The Application of the Phagocytosis Phenomenon in the Diagnosis of Brucellosis. I. The Use of Citrate and "Liquoid". II. The Tropin Reaction].**—*Tijdschr. Diergeneesk.* **67.** 910–915 & 963–978. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **139.** 322]. **1057**

I. The author tested the opsono-cytophagic reaction and found it unsatisfactory when done by the original technique, so he replaced the citrate by "liquoid" (Roche), which makes the serum complement ineffective but does not affect the specific tropins. This modification proved to be effective with human blood, but not with the blood of cattle, goats, or horses.

II. The above tropin reaction was developed and carried out as follows :– the test serum is inactivated at 56°C. and to 0·1 ml. is added an equal amount of washed citrated blood and 0·2 ml. of a *Br. abortus* suspension, the mixture being kept for 30 min. at 37°C. Slide smears are then made, fixed with methyl alcohol, stained by Giemsa, and differentiated in 1% acetic acid. Either live or dead bacilli can be used and the test sera can be kept for some time. Citrated blood from man or animals can be used and the red blood corpuscle suspension can be kept on ice for one day. [The abstract does not give much detail concerning this test.]

In goats infected with live or dead bacilli it was determined that tropins were formed within five or six days after injection.

The test was used on 62 human, 112 bovine, and 66 equine sera and was found to be specific and sensitive. It is recommended for practical purposes on account of the ease and rapidity with which it can be carried out and the result read.

SEELEMANN, M., & LANGELOH, L. (1942). Standardisierung der Untersuchungsmethodik zur serologischen Feststellung der Abortus-Bang-Infektion des Rindes. I. Untersuchung des Blutserums. **[Standardization of Serological Diagnosis of Bovine Brucellosis. I. Examination of Blood Serum].**—*Arch. wiss. prakt. Tierheilk.* **77.** 389–410. **1058**

Over 3,000 bovine sera were tested by the agglutination test in conjunction with the flocculation test, both the Meinicke and Sachweh extracts being used. A smaller number of sera was also tested by the complement-fixation test which was found to be no more sensitive than the others. The Sachweh extract gave a larger proportion of positive reactors than did the Meinicke extract. It is concluded that the most reliable diagnosis of Bang's disease in cattle is obtainable by testing sera by the Sachweh flocculation test. Negative reactions obtained by this test can be accepted as conclusive, but positive sera should also be submitted to the aggln. test. Results of such a combined test are assessed as follows: (1) Negative; Sachweh test negative, aggln. at 1 : 20. (2) Positive; Sachweh test positive, aggln. at 1 : 40 or over. (3) Doubtful; Sachweh test positive, aggln. up to 1 : 20.—R. S. DE R.

TOMPKINS, L. J. (1941). **Calfhood Vaccination in the Control of Bang's Disease.**—*Rep. N. Y. St. Ass. Dairy Milk Insp., 1941.* pp. 11–22. **1059**

A general account of the position including a note on the successful vaccination with strain 19 vaccine of 979 calves in a commercial organization, during the period 1934–41.—D. D. OGILVIE.

*SIGNORELLI, S. (1941). L'infezione brucellare nell'uomo. **[Human Brucellosis in Italy].**—pp. viii + 327. Naples: Casa editr. libr. V. Idelson di E. Gnocchi & F. [L. 50]. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 155]. **1060**

A monograph on *Br. melitensis* infection in Italy. During 1930–39, over 28,000 cases were diagnosed. The reported incidence rose from 0·28 cases per 10,000 in 1930 to 1·08 cases in 1939. The mortality in the corresponding period sank from 15·2 to 7%. It is stated that during any one year the greatest number of cases occurred in spring, following on outbreaks of abortion in sheep, goats, and cattle. The true significance of this fact remains obscure. The best method of treatment appeared to be the intravenous injection of increasing doses of heat-killed vaccine. Prophylactic measures include the control of brucellosis in animals.

Br. abortus infection of human beings is very rare in Italy.—M. LANDAU.

*GEURDEN, L. M. G., BOUCKAERT, J. H., & WILLEMS, A. E. R. (1940). **[Brucella Infection in Horses with Poll and Withers Hygroma].**—*Vlaam. Diergeneesk. Tijdschr.* **9.** 145–154. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 315]. **1061**

Br. abortus was isolated from nine out of 24 horses with hygroma either at the poll or withers. There is discussion as to the respective roles of the trauma and the infection in the causation of these lesions.

Surgical treatment is indicated and a dead vaccine may also be advantageous.

GREEN, M. E., & FREYBERG, R. H. (1941). **The Incidence of Brucellosis in Patients with Rheumatic**

Disease.—*Amer. J. med. Sci.* **201.** 495–504. **1062**

Using a system [the details of which are shown in the table] of diagnosis of brucella infection consisting of skin brucellergen tests, the phagocytic index, and the agglutination reaction as devised by HUDDLESON, JOHNSON, & HAMANN (1933) and modified by KELLER, PHARRIS, & GAUB [*V. B.* **8.** 100.], the authors studied 24 human patients with characteristic atrophic arthritis and 25 human patients with other rheumatic disorders. At the same time the histories of the cases were investigated and blood cultures were made.

Agglutination Test	*Skin Test*	*Phagocytic Power of Blood*	*Status of Patient Towards Brucella*
Negative	Negative	0–20% of cells, slight	Susceptible
Negative	Positive	0–40% of cells, marked	Infected
Positive	Positive	0–40% of cells, marked	Infected
Negative	Positive	60–100% of cells, marked	Immune
Positive	Positive	60–100% of cells, marked	Immune

None of those in the atrophic arthritis group showed evidence of brucella infection. Of those with the other rheumatic disorders three had evidence of active infection and six had "possible brucellosis". Arthralgia and other rheumatic symptoms are common in brucellosis and temporary non-purulent joint inflammation may occur. The authors' data indicate that brucellosis is seldom, if ever, a cause of chronic non-purulent joint inflammation in human beings. These findings were made in Michigan where the milk is pasteurized and the authors infer, from the publications of other authors, that the incidence of brucellosis in rheumatic patients is greater in parts of the U.S.A. where the milk is not pasteurized.

PRITCHETT, H. D. (1942). **Clostridium welchii Infection in a Dog.**—*N. Amer. Vet.* **23.** 600–602. **1063**

A description of a surgical eye case in which enucleation of the eye was carried out because of an injury. *Cl. welchii* (Type and other characters not stated) infection of subcutaneous tissue occurred. The infection probably occurred at, or soon after, the initial eye injury.—C. V. WATKINS.

REED, R. W. (1942). **Nitrate, Nitrite and Indole Reactions of Gas Gangrene Anaerobes.**—*J. Bact.* **44.** 425–431. **1064**

Twenty-one species of the genus *Clostridium* studied could be divided into three groups in respect of the reduction of nitrates and nitrites. Group 1 contained five species which reduced nitrate more rapidly than they did nitrite, and as a result nitrite tests were positive; group 2 contained ten species which reduced nitrite more rapidly than they did nitrate, and as a result nitrite tests were negative, and group 3 contained six species which failed to reduce both nitrate and nitrite or else reduced them at an equally slow rate.

On the basis of indole formation, 17 species studied could be divided into two groups. All species tested utilized indole but group 1 contained four species in which the rate of indole formation was greater than the rate of indole breakdown and so they gave a positive indole reaction. Group 2 contained 13 species in which the rate of indole formation was equal to, or less than, the rate of indole breakdown, and consequently they gave a negative indole reaction.—M. H. KYAW.

*SPANEDDA, A. (1941). Su di un nuovo vibrione agente etiologico di una epidemia nei piccioni. **[A New Pathogenic Vibrio, *V. columbae*, Infecting Pigeons].**—*G. Batt. Immun.* **26.** 518–520. [Translation of abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 475]. **1065**

S. describes an unflagellated vibrio which was isolated from a diseased pigeon. On account of its biochemical and pathogenic properties it is regarded as distinct from Metschnikoff's vibrio, so the name *Vibrio columbae* is proposed.

CLARK, R. (1942). *Eperythrozoon felis* **(sp. nov.) in a Cat.**—*J. S. Afr. vet. med. Ass.* **13.** 15–16. **1066**

A case is described of a severely anaemic, fatal condition in a cat in which the blood showed the presence of parasites indistinguishable from *Eperythrozoon*. Practically all the parasites were ring forms, 0·5–1 μ in diameter and staining pale violet with Giemsa stain. As is usual in *Eperythrozoon* infections, the parasites were not evenly distributed in the smear. No experimental work was possible as only blood and spleen smears were available for diagnosis. As the parasite had not previously been recorded from cats or other felines, it was assumed to be probably a new species. —E. M. ROBINSON.

CANHAM, A. S. (1941). *Grahamella* **(Brumpt 1911) of the Rat: Its Occurrence in Natal.**—*J. S. Afr. vet. med. Ass.* **12.** 122–123. **1067**

A *Grahamella* was found in the blood of a rat killed at the Allerton laboratory, Pietermaritzburg, Natal. This is the first record of the parasite in rats in South Africa. There were no marked anaemic changes in the rat's blood. C. states that although these bodies are probably living organisms, the evidence in favour of their viability is inconclusive. The rat from which they were obtained was perfectly healthy.—E. M. ROBINSON.

PACCHIONI, G. (1941). Sul comportamento del criptococco farciminoso di Rivolta inoculato nel tessuto sottocongiuntivale tarsico del coniglio. **[Behaviour of *Cryptococcus farciminosus* Inoculated under the Conjunctiva of the Eyelids of Rabbits].**—*Nuova Vet.* **20.** 30–35. **1068**

Five rabbits were inoculated under the conjunctiva with *Cryptococcus farciminosus*. In two cases typical nodules resulted, in two there were very small atypical nodules, and in one there was no positive result. In none of the animals was there any generalization of the disease.

In the two typical nodules the pus was very rich in cryptococci, and in P.'s opinion this is a suitable means of obtaining live organisms in practically pure culture; it could also be used for diagnosis.

Detailed histological descriptions are given.—M. W.

*SFORZA, M. (1941). Actinobacillosi in Eritrea. Studio sperimentale del germe e delle tossine. **[Actinobacillosis in Eritrea. Study of the Organism and its Toxins].**—*Arch. ital. Sci. med. colon.* **22.** 106–136. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 463]. **1069**

This is the first description of actinobacillosis in Eritrea, where it was isolated from cattle, from miliary granulomas of the lungs.

The organism and its pathogenic action were studied. There was an endotoxin but no exotoxin. The endotoxin acted on the nervous system (stimulation followed by paralysis) and also caused haemorrhages and infarcts of the liver, heart, and spleen.

A nucleo-protein rich in toxin and a glyco-lipoid poor in toxin were separated from the endotoxin. Bacterial residue after extraction of the above fractions still contained toxic substances.

Sheep, goats, and cattle were very susceptible to the actinobacillus, but rabbits and g. pigs were relatively resistant.

MELENEY, H. E. (1940). **Histoplasmosis. (Reticulo-Endothelial Cytomycosis): A Review.**—*Amer. J. trop. Med.* **20.** 603–616. **1070**

The responsible organism, *Histoplasma capsulatum*, a fungus resembling *Cryptococcus farciminosus*, has been demonstrated in natural infections of the dog, ferret, and in laboratory mice, and experimental infection has been set up in the monkey, g. pig, rabbit, and mouse. In not all animals does the infection become generalized. Diagnosis is confirmed by demonstration and culture of the causal organism and serological methods may be usefully applied. Chemotherapeutic preparations are used in treatment. M. suggests that the incidence of this disease may be higher than is generally believed, as it is not always diagnosed.—K. C. SELLERS.

SALIKOV, M. I. (1940). K ekologii griba Stachybotrys alternans—" vinovnika " stakhibotriotoksikoza loshadei. **[Ecology of the Fungus** *Stachybotrys alternans***].** —*Sovyet. Vet.* No. 6. pp. 53–56. **1071**

S. refers to the classification, occurrence, morphology, and cultivation of *S. alternans* which recently caused fodder poisoning in horses in the U.S.S.R. The fungus is recognized by the characteristic branching of the conidiophores, the number (seven) of sterigmata, and the formation of dark-brown spinulose spores. Infected straw turns dark grey or blackish and the spores form a soot-like dust on the stems. The fungus requires considerable moisture for its development and is favoured by a temperature of 20°–25°C., though it can grow at a range of 5°–40°C. In light attacks, infection is usually localized at the stem nodes. Spread occurs by contact and by dissemination of the spores by air.

Various preventive measures such as the destruction of rubbish heaps, and the making of hay and straw ricks in dry weather on clean sites are recommended.
—A. MOLDAWSKY.

MCFADDEN, D. B., WEAVER, R. H., & SCHERAGO, M. (1942). **The Sanitary Significance of Pectin-Fermenting, Lactose-Fermenting, Gram-Negative, Non-Spore-Forming Bacteria in Water.**—*J. Bact.* **44.** 191–199 **1072**

Results are given of a study of the incidence of pectin- and lactose-fermenting, Gram-negative, non-sporulating bacteria in the faeces of man and animals and in water. Acid production in a synthetic medium containing alcohol-sterilized pectin is described as a criterion for the recognition of pectin-fermenters. Sixty-eight coliform strains isolated from the faeces of three horses and 118 from six fowls did not ferment pectin, whereas three strains from a cow, seven from a mule, and 38 from four dogs were pectin-fermenting. Twenty-eight pectin-fermenters from mule and dog faeces and from water corresponded with *Aerobacter aerogenes* and 32 from cow faeces and from water were classed as intermediate coliform strains. The absence of data concerning the reactions of the genus *Erwinia* and non-pigmented *Serratia* strains on the media used made it impossible to determine whether any of the pectin-fermenters belonged to either genus.—R. O. M.

See also absts. **1180**, **1182**, **1244**, **1245**, **1268**, **1277** (cocci), **1184**, **1243**, **1270**, **1295** (mastitis), **1310** (mastitis in pigs), **1245** (anthrax), **1275** (salmonella), **1169**, **1223**, **1242a**, **1282** (brucellosis), **1170** (*Eperythrozoon ovis*), **1172** (*Fusiformis*), **1166** (tumour-haemorrhagic organisms).

DISEASES CAUSED BY PROTOZOAN PARASITES

FERNANDES, A. (1942). **Maintenance of Cattle in the Agricultural Regions of the Portuguese Colony of Mozambique in Zones or Areas Affected by Tripanosomiasis.** pp. 35. Lourenço Marques: Govt. Printing Works. [4to]. [In English]. Translated from *Documentário Moçambique.* No. 29. (1942). **1073**

The value of cattle for manurial purposes on the copra estates of the lower Zambesi had been recognized as early as 1925, some estates reporting that by keeping cattle they had been able to increase the output of their trees by 50%. With the economic depression of 1929 it became apparent that palm estates which were unable to maintain this manuring would have to close down, but by that time, experimental work on the use of tartar emetic in the treatment of cattle infected with trypanosomiasis had commenced to give results which justified the stocking of the estates, even in some cases when tsetse fly actually occurred on them.

The method adopted is to give an intravenous injection of a 5% solution of tartar emetic in doses varying from 8–12 ml. in calves to 30–40 ml. in adults weighing over 500 kg., at intervals governed by local conditions and the state of trypanosome infection of the herd.

At the commencement of treatment of a herd, three tartar emetic injections at intervals of a fortnight are recommended, whilst for maintenance in areas where tsetse are not involved one injection is given annually in the season when tabanids are most prevalent. When tsetse are present on an estate, 3–4 injections a year are normally recommended for maintenance, but when reinfection is occurring massively, injections are given at monthly, or even fortnightly, intervals.

The owners or other staff on the estate are taught to give the injections, a kraal being recommended in which bays are provided, animals being driven into them and restrained, so that the injection can be given standing.

Accidents are said to be few, provided that the doses recommended are not exceeded and the injection is actually made into the jugular vein. For weak animals the dose should be slightly reduced. Statistics are given showing the rate of increase of herds under treatment on various estates over five or more years, and even when tsetse are present on the estates the results appear to have been very satisfactory. It is noted that the method fails when the region is swarming with tsetse or other biting flies. It is said that the number of flies in an area can be rapidly reduced by Harris traps or by a Zambesian device, " cacà-môscas ", which is not described. The actual state of trypanosome infection of cattle kept under tartar emetic treatment in these areas is not recorded.—U. F. RICHARDSON.

MARTINI, E. (1941). Aus der Epidemiologie der Schlafkrankheit und Nagana. **[Epidemiology of Sleeping Sickness and Nagana].**—*Z. angew. Ent.* **28.** 488–500. **1074**

Attention is drawn to the different problems presented in the control of sleeping sickness in areas

infested with *G. palpalis* and *G. tachinoides*, as contrasted with those in which *G. morsitans* and *G. swynnertoni* are involved. In the former areas the population is usually heavy, deaths being compensated for by births, livestock is little affected, and the fly is restricted to areas of shade on the shores of lakes or rivers. In some areas progress seems to have been made in control by disease surveys of the population and treatment of those found infected. Limited clearings of roads crossing rivers, landing places, etc. are sufficient to prevent serious human infection, and only in a few cases has it been found necessary to abandon areas to allow the infection to die out in the flies. In the case of *G. morsitans* and *G. swynnertoni*, the number of human infections is relatively scanty, but as these flies carry nagana, loss of stock leads to famine conditions and the areas have to be abandoned. These flies occur in arid areas unsuitable for heavy cultivation and show considerable range of movement and power of infiltrating into new country, and their spread is difficult to control by clearings. Methods of control are discussed and emphasis is laid on the value of game destruction.—U. F. RICHARDSON.

ALTURE-WERBER, E. (1941). **Cultivation of *Trypanosoma equiperdum* in Yolk-Sac of Developing Chick Embryo.**—*Proc. Soc. exp. Biol., N.Y.* **48.** 90–92. **1075**

In experiments on the use of chick embryos for the maintenance of *T. equiperdum*, it was found that the best results were given by a dose of two million trypanosomes in citrated blood of infected mice diluted with 0·5 ml. infusion broth (4 per field) inoculated into the yolk sac of chick embryos, 6–10 days old. With this dose the embryos died in 7–11 days. Eggs opened between the first and fifth day after inoculation did not reveal trypanosomes in the yolk sac, though they might be found in the inoculated fluid, but the yolk of such eggs inoculated into mice produced infection. Eggs opened on the seventh day showed a blood infection. An inoculation of one million trypanosomes also caused infection, but the inoculation of 150,000 trypanosomes, or less, failed to produce an infection of the eggs, detectable either microscopically or by mouse inoculation.—U. F. RICHARDSON.

—. (1942). **Bovine Trichomoniasis in Great Britain.** —*Vet. Rec.* **54.** 421–424. **1076**

This statement was issued by the Ministry of Agriculture after an enquiry into the incidence of trichomoniasis in Great Britain. It deals with the distribution of the disease and provides information on methods of diagnosis and treatment.

The disease had, at that time, been diagnosed in 21 English counties, and suspected outbreaks had occurred in a further 11 counties. In Wales it had been detected in five counties and suspected in a further two counties, and in Scotland it had been diagnosed in two counties, with suspected outbreaks in six others. The distribution is irregular and may change considerably within a year or two. Failure to demonstrate trichomonads cannot always be accepted as proof of their absence. When the disease is associated with contagious abortion, positive agglutination reactions may be misleading, as the breeding troubles may actually be due to *T. foetus* abortions.

The disease should be suspected (a) when several cows or heifers frequently return to service, usually after 6, 9, or 12 weeks, (b) when abortion occurs in the early stages of pregnancy, commonly between the 6th and 16th weeks, (c) in cases of endometritis or pyometra, associated with anoestrus, and (d) in cases of vaginitis and cervicitis.

For diagnosis the examination of fresh smears from vaginal discharge is recommended. Material for examination can usually be obtained by the use of a cottonwool swab moistened with normal saline, the specimen being best obtained from the vicinity of the external orifice of the cervix. In some cases it may be necessary to make washings of the vaginal mucosa, or to collect discharge from the uterus. It is best to examine the specimen first with a low power objective, noting evidence of movement, and, when a suitable field is found, to examine this under a high power objective. Agglutination tests with a trichomonas antigen have been used with some success, but a negative reaction does not always imply freedom from infection.

Curative treatment of female stock has been practised with considerable success as regards elimination of infection, but breeding capacity in some cases may remain impaired even after cure of the infection. Chinosol, iodine solutions or iodine and lactic acid have been used with success for irrigation of the genital tract. The treatment of bulls has been found to be protracted and uncertain, and the slaughter of infected bulls is advised. For bulls of exceptional value, ABELEIN's treatment is suggested [see *V. B.* **12.** 336].

In herds suspected of infection, the suspension of breeding operations, the treatment of females found infected, and the providing of a new bull free from suspicion of infection for the service of the healthy female stock, are the measures recommended.

—U. F. RICHARDSON.

GILYARD, A. T., & GILYARD, R. (1942). **Clinical Observations in Bovine Trichomoniasis.**—*J. Amer. vet. med. Ass.* **101.** 276–278. **1077**

It is emphasized that bovine trichomoniasis is a venereal disease, bulls remaining permanent carriers. It is not believed that they become free from infection either on protracted restriction from service or under therapeutic treatment. The habitat of the parasite in the female is the endometrium where varying degrees of endometritis are instigated. A high percentage of females when first served by an infected bull fail to conceive, and if returned on regular successive heats still fail to conceive. When conception occurs, abortion may take place after 90–150 days. Frequently trichomoniasis induces cessation of oestrus with uterine atony and the development of pyometra, the intra-uterine fluid teeming with trichomonads. If pyometra is of long standing, the corpus luteum may not be removable by crushing, and subsequent conception and full-term pregnancy is unlikely. When pyometra is diagnosed early, and the corpus luteum is readily removed, the endometrium is likely to return to normal.

For diagnosis it is recommended that direct smears be made by the clinician from the females of the herd, and if these do not reveal trichomonads the bull should be examined. The preputial hair is trimmed and the sheath swabbed with a small pledget of cottonwool saturated with normal saline to which 0·5% dehydrated blood serum is added. Five or six swabs are taken, deposited in a container and incubated at room temperature for 24–48 hours, examinations being made at four-hour intervals.

For control, eradication may be practised, or the encouragement of tolerance to infection in the females. Females which have not conceived after service by an infected bull are withheld from breeding over three successive heats, after which they will usually conceive to service by the same bull. It appears that during this brief rest they build up a tolerance simulating immunity. It is not believed that trichomonads survive pregnancy, and an infected cow which has conceived will later hold to an infected bull, or can be bred to a healthy bull without danger of infecting him. When prompt

eradication is desired, infected bulls are slaughtered and females suspected of infection are inseminated artificially.—U. F. RICHARDSON.

SCHNEIDER, M. D. (1942). **On the Isolation and Growth of a Bacteria-Free Strain of Trichomonas Fetus in Minnesota.**—*J. Amer. vet. med. Ass.* **101.** 245–247. **1078**

Bacteria-free cultures of *T. foetus* were obtained from vaginal washings of an infected cow by washing the trichomonads 2–3 times in normal saline solution by centrifugation, then concentrating them in 1–2 ml. of a solution containing sodium carbonate, bovine serum, and haematin and using this to inoculate one arm of a "V" tube containing a semi-solid medium composed of sodium carbonate solution, bovine serum, and agar. The trichomonads migrated into the uninoculated arm of the "V" tube, and in the case described, a bacteria-free culture was obtained from material taken from this arm after allowing six hours for migration. Two cultures made after 15½ hours' migration were both contaminated.

Cultures kept at room or incubator temperatures in either serum + sodium citrate or serum + sodium carbonate media will last 30–60 days, and if evaporation is prevented by covering the tubes with "parafilm" or by sealing them, cultures can be kept over 60 days, and subcultures easily started from them.—U. F. R.

MCNUTT, S. H., & TRUSSELL, R. E. (1941). **Comparison of Growth of *Trichomonas foetus* and *Trichomonas vaginalis* in Chick Embryos.**—*Proc. Soc. exp. Biol., N.Y.* **46.** 489–492. **1079**

T. vaginalis could be grown in chick embryos, but infection was much more difficult to establish and growth was much less profuse than is the case with *T. foetus*. Both organisms develop in the allantoic and amniotic fluids, and were not found in the egg white, the yolk sac, the actual embryo, or its bloodstream. It is concluded that these two protozoa are probably not pathogenic to chick embryos under such conditions.

—U. F. RICHARDSON.

CLARK, R., & JACKSON, C. (1942). **Two Cases of Myositis Caused by Sacrosporidia.**—*J. S. Afr. vet. med. Ass.* **13.** 12–14. **1080**

Although sarcosporidia do not usually cause tissue changes, these two cases are recorded to show that myositis may result from their presence. In the first, which occurred in a pig, the heart muscle showed a very heavy infection of typical sarcocysts with, in addition, numerous greyish, opaque areas about the same size as the sarcocysts. These latter were necrotic foci surrounded by masses of round cells, numerous eosinophiles, and some mast cells. Traces of sarcocysts could be seen in a number of these foci which were undoubtedly caused by them.

In the second case, specimens were examined of the masseter muscles of a horse which had died of colic. The animal has shown marked bilateral swelling of the masseter muscles in life. Multiple small caseous to calcified foci, containing the remains of eosinophiles, were seen in the muscle. The foci were surrounded by round cells and a few giant cells were seen. This case was assumed by the authors to be sarcosporidosis from the character of the lesions only, but no sarcosporidia were seen.

These tissue reactions may have been due to the rupture of sarcocysts with the release of the toxic substance, sarcocystin, into the surrounding area.

—E. M. ROBINSON.

ZEETTI, R. (1942). Osservazioni sul primo focolaio di coccidiosi renale delle oche osservato in Italia. [**Renal Coccidiosis in Geese (First Record in Italy)**].—*Nuova Vet.* **20.** 126–130. **1081**

Renal coccidiosis in geese on the continent of Europe has been reported in France, Germany, Russia, and Estonia, but this is the first authentic record of its occurrence in Italy. The species described is *Eimeria truncata*. The oocysts when first passed in the urine consist of a granular protoplasmic mass invested by a double membrane with a micropyle at the truncated pole. Sporulation, under favourable conditions of temperature and humidity, is completed in 25 hours. Infection of the kidney is attained through the bloodstream, and on arrival the parasites lodge in the epithelial cells of the uriniferous tubules where development is continued. Infected birds become depressed and emaciated and there is great evidence of weakness. The disease, which requires an incubation period of 2–4 days, is characterized by rapid deaths (2–3 days) in 80–100% of cases. The lesions involve a change of colour in the infected organ and notable enlargements. Numerous series of striations can be seen in addition to white nodular patches of variable size. Histological examination of the kidney reveals the different developmental stages of the parasite situated in the walls of the uriniferous tubules and examination of the kidney permits a rapid and safe diagnosis of the disease. [The interest of this paper lies in the record rather than in the described observations.]—C. HORTON SMITH.

LEVINE, P. P. (1942). **Excystation of Coccidial Oöcysts of the Chicken.**—*J. Parasit.* **28.** 426–428. **1082**

Some workers are of the opinion, contrary to general belief, that digestive enzymes play no part in the excystation of coccidial oocysts of chickens. This difference in view led L. to carry out the experiments here described. The pancreatic ducts were ligated in a number of coccidia-free chickens 5–12 weeks old. Sporulated oocysts were fed to these and to control birds and their faeces were subsequently examined for discharged oocysts, by flotation and by feeding of incubated faeces to coccidia-free chickens. None of the birds with ligated ducts became infected on receiving sporulated oocysts. The feeding of merozoites, however, produced prompt infections which showed that the intestinal epithelium of ligated birds could still support coccidial growth. In view of these observations, it was concluded that the sporulated oocysts must have passed unchanged through the intestine of the birds with ligated ducts. The faeces of ligated and control birds were collected during the 24 hours following the administration of sporulated oocysts of *E. praecox* and *E. tenella* and were placed in a refrigerator for 24 hours and then fed to each of two coccidia-free birds, in order to find the relative numbers of sporulated oocysts discharged by ligated and control chickens. In the case of *E. praecox* it was estimated that the faeces of the ligated bird produced 100 times as many oocysts as those of the control. Similar results were obtained for *E. tenella*. L. concludes that pancreatic juice is therefore necessary for the excystation of sporulated oocysts.

—C. HORTON SMITH.

MULLIGAN, H. W., & RUSSELL, P. F. (1940). **Agglutination of Sporozoites of *P. gallinaceum*. Preliminary Note.**—*J. Malar. Inst. India.* **3.** 199. **1083**

Serum from normal fowls and rhesus monkeys agglutinated sporozoites of *Plasmodium gallinaceum* at a dilution of 1 : 16, and serum from normal human beings, sinicus monkeys, and rabbits agglutinated them at a dilution of 1 : 32. Agglutination was obtained at slightly higher dilutions with serum from human cases of chronic *P. falciparum* infection and from monkeys with *P. cynomolgi*, *P. knowlesi*, or *P. inui* infection. With

the serum of fowls with chronic *P. gallinaceum* infection, agglutination occurred at dilutions of 1 : 8,000 or even higher.

*Rodhain, J., Gavrilov, W., & Cowez, S. (1940). Essais d'infection des cultures de tissus d'embryon de poulet par les sporozoites de plasmodium gallinaceum. [**Attempts to Infect Fowl Embryos with Sporozoites of** *P. gallinaceum*].—*C. R. Soc. Biol. Paris.* **134.** 261–264. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 105]. **1084**

The observations described indicate that sporozoites of *P. gallinaceum* failed to develop in tissue cultures and fowl embryos.—C. Horton Smith.

Enigk, K. (1942). Die intrauterine Übertragung von Blutprotozoen bei den Haustieren. [**Intra-Uterine Transmission of Blood Protozoa among Domestic Animals**].—*Dtsch. tropenmed. Z.* **46.** 153–160. **1085**

A splenectomized cow infected with *Babesia bigemina*, *Anaplasma centrale*, and *Theileria mutans* failed to transmit any of these parasites to its calf, the possibility of latent infection of the calf being excluded by the inoculation of its blood into other animals. The calf was later inoculated with blood from the dam and developed *A. centrale* and *T. mutans* infections. The literature of intra-uterine transmission of blood protozoa is discussed and it is suggested that it occurs most readily when the dam has an acute infection, and that it is favoured by petechial haemorrhages or other damage to the placenta.—U. F. Richardson.

Neitz, W. O. (1941). **The Occurrence of** *Babesia bovis* **in South Africa.**—*J. S. Afr. vet. med. Ass.* **12.** 62–66. **1086**

In recent years severe outbreaks of redwater have occurred in animals born and bred on known redwater farms, and such cases did not respond to treatment with trypan blue. Blood was obtained from a field case and the infection carried through five generations in calves. *B. bovis* was found to be the cause of the infection and cross-immunity tests on calves immunized against it and against *B. bigemina* showed the parasites to be distinct. The vector was not determined, but it is possible that, in the absence of *Ixodes*, the three known vectors of *B. bigemina* may transmit *B. bovis*. Acaprin was of no value for treatment of *B. bovis* infection but gonacrine was found to be effective.—E. M. Robinson.

*Floch, H., & Abonnenc, E. (1940). Piroplasma bigeminum et Margaropus annulatus à la Guyane française. [*Babesia bigemina* **and** *Boophilus annulatus* **in French Guiana**].—*Bull. Soc. Path. exot.* **33.** 407–410. **1087**

*Floch, H., & Abonnenc, E. (1941). Piroplasma bigeminum et Boophilus annulatus microplus à la Guyane française. [*Babesia bigemina* **and** *Boophilus annulatus microplus* **in French Guiana**].—*Ibid.* **34.** 121–124. **1088**

[Abst. from absts. in *Zbl. Bakt. I.* (*Ref.*). **141.** 111].

The authors found a strain of *B. bigemina* in French Guiana, and *Boophilus annulatus microplus* was found to be the principal vector. The second paper appears to be merely a reiteration.—E. R. Pariser.

Sergent, Et. (1940). Essai de transmission de la theilériose bovine, par des anophèles. [**Attempts to Transmit Bovine Theileriasis by** *Anopheles*].—*Arch. Inst. Pasteur Algér.* **18.** 237. [Abst. from abst. in *Rev. appl. Ent.* Ser. B. **30.** 148. **1089**

An attempt to transmit *Theileria annulata* by 24 females of *Anopheles maculipennis* var. *labranchiae*, at least a month after their feeding on an infected animal, was unsuccessful.—U. F. Richardson.

Enigk, K. (1942). Beobachtungen über die Spirochätose des Schweines. [**Observations on Spirochaetosis in Swine**].—*Dtsch. tropenmed. Z.* **46.** 305–312. **1090**

Investigations are recorded in South Africa and Kenya into infections of swine in which ulceration of the skin and abscess formation are associated with a spirochaete and a fusiform bacillus. The condition occurs in the rainy season and is only prevalent in damp, dirty kraals, small wounds or skin abrasions apparently being necessary for the invasion of the organisms. Systemic and local treatment with arsenicals has been recommended, but such treatment has not been found satisfactory in practice. Experimental treatment of a small number of animals by four injections, given at intervals of 2–5 days, of 10 ml. of the animals' own blood, given subcutaneously and intramuscularly in the neighbourhood of the ulcer, combined with the application of hydrogen peroxide or arsenical ointments, led to recovery in three weeks. It is recommended that kraals be well drained, partly roofed, and provided with a raised wooden floor. Cement floors are said to cause skin abrasions.—U. F. Richardson.

Kligler, I. J., & Kaplan, D. (1941). **Studies on the Cultivation of** *Sp. gallinarum*.—*Proc. Soc. exp. Biol., N.Y.* **48.** 103–106. **1091**

A study of the nutritive requirements of *Spirochaeta gallinarum* was undertaken in an attempt to eliminate the variability of media hitherto proposed. Each component was studied in turn to establish to what extent it is required and, if required, its optimum concentration.

The medium finally obtained consisted of :– 1,000 ml. of a basic salt solution, 4 g. proteose Difco peptone, 1 g. glucose, 3 g. sodium lactate, and 0·001 g. thioglycollic acid. Before inoculation, 1 ml. rabbit serum and 0·6 ml. of sedimented chicken red blood cells, re-suspended in an equal quantity of basic salt solution, are added to each 10 ml. of medium.

The basic salt solution can be Tyrode's solution, or a solution containing sodium and magnesium chlorides and sodium and potassium phosphates. Rabbit serum gave the best results, but the sera of other animals can be used. Chicken r.b.c. are essential for good growth. It has been claimed that a layer of liquid paraffin is essential, but equally good results were obtained by using rubber stoppers.

Cultures grow best at 37°C., optimum growth being reached in 4–5 days. If transferred to the refrigerator at this stage, cultures remain viable for ten days to two weeks, and subcultures have been made up to the 15th day.—U. F. Richardson.

Das Gupta, B. M. (1942). **Peculiar Serological Behaviour of a Strain of** *Leptospira canicola*.—*Indian med. Gaz.* **77.** 406–407. **1092**

Fresh, normal serum from human beings and several species of animals was found to agglutinate a laboratory strain of *L. canicola* in low dilutions up to 1 : 40 and 1 : 80. The property was lost when the serum was kept for a week or so, or when it was heated at 56°C. for 30 min. The possibility of other strains behaving in the same way should be borne in mind in the diagnosis of leptospiral infections.

Lewis, M. (1942). **The Incidence of** *Leptospira icterohaemorrhagiae* **in Trapped Rats in Philadelphia.**—*Amer. J. trop. Med.* **22.** 571–576. **1093**

Out of 100 wild *Rattus norvegicus* trapped in retail food establishments in Philadelphia, 11 were proved to be carriers of *L. icterohaemorrhagiae*. Dark-ground illumination of urine or kidney emulsion revealed only two of the infections, and culture of the urine only four.

The 11 animals were proved positive by subcutaneous inoculation of kidney emulsion into g. pigs, and in 10 of the 11 cases cultures of kidney emulsion were positive. Ten of the positive animals were adults, and it is noted that the urine of these animals was alkaline. It is suggested that the leptospira may be destroyed in rats in which the urinogenital tract is acid.—U. F. R.

DAS GUPTA, B. M. (1942). *Spirillum minus* **Infection Acquired from an Indian Squirrel** (*Sciurus* **sp.**).—*Indian med. Gaz.* **77.** 541–542. **1094**

Brief reference is made to recorded cases of "rat-bite fever" from the bites of animals other than rats. A case is described in a boy in whom symptoms appeared two weeks after he had been bitten by an Indian squirrel. Blood from the patient was inoculated into four mice and two g. pigs; *S. minus* was later demonstrated in the peritoneal fluid of three of the mice and one of the g. pigs.

See also absts. **1142**, **1299**, **1313**, **1314** (trypanosomiasis), **1247** (trichomoniasis), **1248** (coccidiosis), **1170**, **1256**, **1314** (anaplasms and piroplasms).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

JANSEN, J. (1942). Gehirnimmunität bei Infektionen mit Filtrierbarem Virus. **[Cerebral Immunity in Virus Infections].**—*Zbl. Bakt. I.* (*Orig.*). **149.** 190–192. **1095**

Using a virus isolated in 1931 from rabbits [(1933). *Zbl. Bakt. I.* (*Orig.*). **128.** 465.], J. observed that intracerebral infection was invariably fatal in mice as well as in rabbits. Continuing the work with mice he found that subcutaneous inoculation caused no visible disease or ill health and that such mice were immune to a subsequent intracerebral inoculation, *i.e.* the former inoculation had conferred cerebral immunity.

J. obtained the same result with Aujeszky's disease virus [see *V. B.* **5.** 273.], though the results (with only a few animals) were not as clear-cut.—J. E.

MAAS. (1942). Erfahrungen über die aktive Immunisierung gegen Maul- und Klauenseuche mit normaler und gefrorener Riemser MKS.-Vakzine. **[Experiences in Active Immunization against Foot and Mouth Disease with Riems Vaccine which had been Frozen].**—*Berl. Münch. tierärztl. Wschr.* Jan. 9th. 2–5. **1096**

In a detailed account of vaccination of 12,425 cattle in 1,247 herds in a compact area, an unexpectedly high proportion of post-vaccination cases occurred in a district in which there was severe frosty weather during the time of inoculation, so that many bottles of vaccine became frozen during transit. As vaccine of the same batches used during mild weather gave excellent results, it is concluded that the vaccine used in the above cases had been damaged by frost.—J. E.

WALDMANN, O. (1942). Ueber die zukünftige Gestaltung der Bekämpfung der Maul- und Klauenseuche mit Hilfe der Vakzinierung. **[Future Control of Foot and Mouth Disease with the Aid of Vaccination].**—*Berl. Münch. tierärztl. Wschr.* July 24th. 221–227. **1097**

W. estimates the loss caused by the 1937–40 epizootic in Germany at 1·5 milliard RM, calculated from an average reduction in value per affected animal from 300–400 RM down to 150–250 RM. The ordinary veterinary police laws failed to stop the invasion of Germany by the disease because of the lack of natural barriers, the economic impossibility of stamping out the disease at the frontiers, and the difficulty of imposing adequate restrictions for quarantine purposes.

The development of the Riems vaccine and its large-scale tests during the outbreak are reviewed and it is concluded that it has been proved to be a valuable weapon in F. & M. disease control, as post vaccination infection is negligible (below 2%). With its use it is possible to build a wall of immunized animals between a source of infection and an uninfected area.

In the future, in order to preserve a country from infection, it is necessary to establish a good warning system by which the occurrence of the disease in neighbouring lands can be detected without delay, and to have a large supply of vaccine ready for use to create an immune belt opposite the direction of threatened invasion. The Riems establishment is not large enough to supply the necessary vaccine, so W. advises the establishment of five or six vaccine production centres around the western and eastern perimeter of Germany. The isolation of such centres on islands is no longer necessary, provided that they are constructed according to the special requirements. The application of vaccine must be organized on a zone basis by a special staff and all participators in a vaccination campaign must be adequately instructed in advance.

The paper contains a graph showing the extent of the disease in Germany since 1886.—J. E.

MASON, H. C. (1942). **A Comparative Study of the Behavior of Street and Fixed Viruses of Rabies in the Mouse.**—*Amer. J. Hyg.* **36.** 153–167. **1098**

Tests on mice of a number of fixed strains of rabies virus, including some strains that had apparently lost their cord propagating property, showed that all the strains were closely related in their ability to produce convulsions and priapism. Considerable divergence in character appeared, however, in 21 strains of street virus tested. One strain with an m.c.l.d. (minimum cerebral lethal dose) and end-point of 10^{-2} killed mice more rapidly than did two strains with an m.c.l.d. of 10^{-4} and an end-point of 10^{-5}. The practical results of antirabic vaccination with street virus strains are considered.

—D. D. OGILVIE.

BALOZET, L. (1940). La vaccination antirabique des animaux en Tunisie du 1er janvier au 31 décembre 1939. **[Antirabic Vaccination of Animals in Tunisia during 1939].**—*Arch. Inst. Pasteur Tunis.* **29.** 343–346. **1099**

A total of 439 doses of vaccine were issued, of which 235 doses were for "repeat" injections. Nine doses for curative purposes were also issued.

Since the beginning of preventive vaccination in Tunisia in 1931, 3,277 dogs have been vaccinated and all have remained free from rabies. Only five out of 82 animals vaccinated after exposure to infection have died of rabies during the same period.—J. E.

BURNET, F. M., & CLARK, E. (1942). **Influenza. A Survey of the Last 50 Years in the Light of Modern Work on the Virus of Epidemic Influenza.**—*Monogr. Walter & Eliza Hall Inst., Melbourne.* No. 4. pp. 118. Melbourne: Macmillan & Co., Ltd. [4to] [17s. 6d.] **1100**

Knowledge gained from epidemiological and laboratory studies is reviewed and assessed and possible methods of dealing with an outbreak of epidemic influenza similar to the 1918–19 outbreak are discussed. A moderate success in immunizing against current mild influenza is the only practical result of influenza virus research and it is stated that immunization against epidemic influenza would probably be much more difficult.

The monograph contains considerable comparative information and it is interesting to compare influenza

of man with the respiratory diseases of the horse [see also *V. B.* **12.** 580]. The impression is gaining ground that nearly all the common respiratory infections of man are primarily due to a virus infection. There is a well marked predilection of influenza for the colder months of the year and as it is a droplet infection, the reasons for this predilection are superficially so convincing that it is difficult to understand why the main prevalence of all droplet infections is not during this period.

The pathological changes in the nasal and respiratory mucosa are described. Following intranasal inoculation ferrets are solidly immune for about three months but after 8–12 months the majority are fully susceptible again. The ferret produces antibodies following the subcutaneous inoculation of virus but does not become immune. The mouse is immune following intranasal infection and develops a lesser degree of immunity following intraperitoneal or subcutaneous inoculation; it is suggested that this is due to a qualitative difference in antibodies rather than to a local tissue immunity.

There is little correlation between a low antibody titre and susceptibility during an epidemic, and the role of the virus-inactivating agent which occurs in nasal secretion, and is active *in vitro* against a number of viruses including influenza and louping ill, is uncertain.

What happens to the virus in inter-epidemic periods is not known, but outbreaks of disease in isolated communities following the arrival of healthy visitors suggest that carriers exist. Shope's work on the survival of swine influenza virus in the eggs of lungworms is regarded with considerable scepticism by these authors.

—JOHN FRANCIS.

ANDREWES, C. H. (1942). **Thoughts on the Origin of Influenza Epidemics.**—*Proc. R. Soc. Med.* **36.** 1–10. **1101**

It is pointed out that in the even years 1934, '36, '38, '40, '42, practically no evidence of human influenza "A" virus was obtained, whereas in the odd years 1935, 1939 and 1941, this strain was isolated although not on a large scale. The severe "A" outbreaks of 1929, 1933, and 1937 suggested a four-year cycle which, however, was broken by the relatively low incidence in 1941.

Taking into account the theory of SHOPE that swine influenza virus is seeded into a herd well in advance of an epidemic by means of the latent form present in the lungworm, and precipitated by a sudden climatic change, it is postulated that human virus may also exist in an occult form. The grounds for this belief lie in the periodicity of outbreaks, the major ones due chiefly to "A" virus and others due partly or wholly to "B" virus; in a third group, which clinically resembles influenza, no virus can be detected by existing methods (so called "Y" strains). Some relationship seems to exist between the immunity of individuals and the level of serum antibodies: nevertheless, potent antibodies only diminish to a limited extent the liability to infection.

In order to explain the cyclic changes, it is suggested that there is a basic virus which is of such low pathogenicity that it fails to infect man with overt symptoms, fails to stimulate recognizable antibodies, and is not infectious for normal laboratory animals. Such a virus may persist indefinitely and harmlessly in the cells of human carriers. In winter when other respiratory pathogens pass more easily from host to host, this basic virus also travels and a chance passage through several successive hosts with low "A" antibody may increase its virulence. In this way viruses of enhanced pathogenicity can be built up, starting from the supposed "Y" virus at present only detectable on clinical grounds, and leading to viruses which are of low pathogenicity for ferrets and eventually peter out, to viruses which produce recognizable antibodies but are limited in their attack, and finally to those which cause widespread and severe outbreaks.

Methods of combating influenza by vaccination and by immune sera are briefly discussed.—R. E. GLOVER.

*EBERBECK. (1941). Zur Bekämpfung der Pferdeseuchen, insbesondere des ansteckenden Katarrhs der Luftwege und seiner Folgeerscheinungen im Kriege. [**Control of Equine Diseases, Especially Equine Infectious Bronchitis and its Sequelae in Wartime**].—*Z. Veterinärk.* **53.** 311–315. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 455]. **1102**

Equine infectious bronchitis [E.I.B.] is very widespread and is common in remount depots. Four clinical stages can be distinguished, *viz*, the pure virus infection, the acute disease with lung complications, the chronic disease with lung complications (both due to secondary streptococcal infection), and the stage of delayed injury due probably to streptococcal toxin, which causes sero-proliferative, so-called "allergic" inflammation. The latter may affect the whole body and commonly affects the heart, kidneys, and nervous system [see EBERBECK—*V. B.* **11.** 39.] and perhaps the eyes, hoof matrix and skin [a suggestion of common causation of such diseases as periodic ophthalmia, nephritis, and laminitis.]

The chronic disease was found in 25% of all horses which died of strangles or E.I.B. and which E. examined in 1938–39. In many such cases the chronic lesions resembled those of equine infectious anaemia, and E. suggests the possibility of a common causal factor in E.I.B. and E.I.A. The latter may even not be a distinct disease. Similarly, changes in the uterus leading to abortion may be primarily due to chronic injury of the spinal nerves originating from E.I.B. and only be secondarily associated with bacterial infection of the uterus.

SEYMOUR, R. T., & STEVENSON, D. S. (1942). **Equine Respiratory Diseases in Newly Purchased Animals.** —*Army vet. Bull., Wash.* **36.** 81–92. **1103**

This paper is based on the authors' experience in handling 3,400 cases of respiratory disease during the last three years. In the year 1940–41, 13,000 animals were received at a remount depot and the mortality from all causes was 2·37%.

It was not always easy to distinguish between strangles and influenza, in many animals there appeared to be a combination of both diseases. Two types of "strangles" were seen, one in which a serous nasal discharge was followed by a muco-purulent discharge with no glandular enlargement, and another in which the usual glandular swellings were observed. [It is probable that most authors would have used the term "infectious catarrh" to describe the former condition —see *V. B.* **12.** 580.] Occasionally the axillary or inguinal, but more frequently the perianal glands were affected. It is stated that anti-streptococcal serum was useful in the treatment of strangles.

The intestinal form of influenza was rarely seen. Contrary to general experience, neoarsphenamine was valuable in the treatment of influenza, particularly when given early, but was less valuable in the treatment of pneumonia. Sulphanilamide gave better results in this condition. Injections of glucose saline and indirect blood transfusion were used to combat circulatory weakness. Two equine blood donors immune to the respiratory diseases were kept for the latter purpose.

Purpura haemorrhagica was usually associated with one or other of the respiratory diseases. Tracheotomy and intubation were performed when necessary to prevent asphyxiation.

The daily intravenous injection of 10 ml. of formalin in 120 ml. of distilled water gave better results in the treatment of this condition than either calcium gluconate, given intravenously, or blood transfusion.

In general, mules appeared to be more resistant than horses to respiratory disease, but this may have been because they had previously been exposed to infection in dealers' yards.—JOHN FRANCIS.

GRATZL, E., & TRAUB, E. (1942). Zum Vorkommen von hämolytischen Streptokokken bei den katarrhalisch-entzündlichen Erkrankungen der Luftwege des Pferdes. **[Occurrence of Haemolytic Streptococci in Catarrhal Respiratory Diseases of Horses].**—*Arch. wiss. prakt. Tierheilk.* **77.** 347–377. **1104**

Seventy horses, of which 25 were normal and 45 had diseases of the respiratory tract of an infectious nature, were investigated by means of endoscopy of the nose, throat, larynx, and air sacs and by auscultation. At the same time swabs were taken from the mucous membranes of the nose, throat, air-sacs, trachea, from the palatine tonsil, and from the peritonsillar lymphatic tissue. The streptococci isolated that fell into Lancefield's group C were divided into biochemical types. No classification of α streptococci was attempted. These were relatively infrequent in the lung or trachea.

It was found that horses showing no catarrhal inflammation of the respiratory tract, as revealed by endoscopy, more frequently harboured haemolytic streptococci on the tonsil and associated lymphatic tissue than on the mucous membrane of the nose and throat. In cases where inflammation was demonstrable by endoscopy, haemolytic streptococci were invariably present. Only in one case of strangles was *Str. pyogenes animalis* found in pure culture on the mucous membranes. In many cases of strangles this organism was found in association with *Str. equi*. From strangles abscesses *Str. pyogenes animalis* was never recovered in pure culture, though in two cases it was present in association with *Str. equi*. The latter organism was isolated from three cases of infectious catarrh. It was never isolated from normal horses, though from these *Str. pyogenes animalis* could be isolated. Haemolytic streptococci were never isolated from the lungs of normal horses.

Details are given of case histories and swabbing technique.—D. L. ROBARTS.

I. KERN, W. (1940). Die Entwicklung der veterinärpolizeilichen Anordnungen des Staates Preussen zur Bekämpfung der ansteckenden Blutarmut der Einhufer. **[Development of Prussian Veterinary Police Measures for the Control of Equine Infectious Anaemia].**—*Z. Veterinärk.* **52.** 49–68. **1105**

II. KRAUSE, C. (1941). Betrachtungen über die ansteckende Blutarmut der Einhufer. **[Equine Infectious Anaemia].**—*Tierärztl. Rdsch.* **47.** 288–294. **1106**

III. TRAUB, E., WALBRECHT, H., & SCHÄFER, W. (1941). Komplementbindungsversuche bei der ansteckenden Blutarmut der Pferde. **[Complement Fixation Tests in E.I.A.]**—*Berl. Münch. tierärztl. Wschr.* March 14th. 134–135. **1107**

IV. OPPERMANN. (1942). Einiges über die ansteckende Blutarmut der Pferde. **[Notes on E.I.A.]**—*Dtsch. tierärztl. Wschr.* **50.** 53–55. **1108**

V. WEIDLICH, N. (1942). Beitrag zur histologischen Diagnose der ansteckenden Blutarmut der Pferde. **[Histological Diagnosis of E.I.A.]**—*Berl. Münch. tierärztl. Wschr.* March 20th. 85–88. **1109**

I. This is an historical review of the administrative control of E.I.A. in Prussia from 1919 to the present. The enacted control orders changed many times to conform with the introduction of new methods of diagnosis; no reliable method is available, except the demonstration of the infective agent by the inoculation of equines. Failing the use of this test, diagnosis is still very difficult and at present is based on results of clinical examination, blood picture, P.M. appearance and the histology of the liver, spleen, kidneys, heart, and splenic lymph nodes. When a positive diagnosis is made in Germany the animal is slaughtered and monetary compensation given in cases where the above *ante-mortem* tests are positive in horses in a known infected locus. Meat of infected horses is declared unsuitable for human consumption. Appended to the paper is a list of about 100 references in the German literature.

II. This is the text of a post-graduate lecture on E.I.A. It reviews the recent advances and covers the following points:—nature of the causal agent, transmission by biting flies, viability of the virus, natural resistance of horses, mechanism of infection, pathogenesis, distribution of the virus in the body, gross pathology and micropathology, and diagnosis. There are five original photographs, together with a select reference list.

III. The authors describe in detail their attempts to demonstrate complement-fixing antibodies in E.I.A. Two horses were inoculated repeatedly with formolized virus and were tested. One horse yielded apparently genuine reactions, but the other only reacted on one out of many occasions. In tests on 25 naturally infected horses only one gave a positive reaction. Complement fixation is therefore regarded as valueless in E.I.A.

The two experimental horses succumbed rapidly when inoculated with a strong virus, so that the formolized virus used as a vaccine did not confer immunity.

IV. A commentary on current points of interest concerning epidemiology and diagnosis. O. considers the sublimate test for blood euglobulin to be more useful than the sedimentation test. Although both are non-specific, a positive sublimate test indicates that an infected horse is contending with an infection, the euglobulin increasing as the horse overcomes the infection [see KIRCHMEYER—*V. B.* **12.** 247]. Animals with helminthiasis, but free from E.I.A., do not react to the test.

V. A report on four groups of horses whose liver, spleen, and kidneys were examined histologically in order to correlate clinical and pathological diagnostic methods. Criteria for the establishment of a positive diagnosis are not set out, but merely alluded to with reference to the opinions of experienced workers on the disease.—J. E.

MORETTI, B. (1941). Osservazioni cliniche sull'anemia infettiva del cavallo. **[Equine Infectious Anaemia—Clinical Observations].**—*Nuova Vet.* **20.** 51–59. **1110**

M. describes the various clinical forms of E.I.A. and gives personal reports on two natural and two experimental cases. Of interest is the fact that he found the respiration rate to be practically normal throughout the course of the disease, even when the temperature was high and the pulse rate increased.—M. WATSON.

STEIN, C. D., & MOTT, L. O. (1942). **Studies on Congenital Transmission of Equine Infectious Anemia.**—*Vet. Med.* **37.** 370–377. **1111**

Most workers have been indefinite regarding congenital spread of the disease. Protocols are given of experiments which show that milk of mares and semen of stallions may contain the virus. A subclinical form of the disease was set up in a normal horse by injections of tissue suspensions from a normal colt which had been nursed by an infected mare. Subcutaneous injection of infected semen into a mare produced a subacute form

of the disease, but infection in two mares was not transmitted to a normal stallion after it had served them repeatedly.

A prolonged symptomless carrier state was demonstrated in a horse six years after it had acquired the disease.—C. V. WATKINS.

PRIETO, C., & GROSSO, A. M. (1939). Histopatología de la encefalo-mielitis experimental a "virus argentino". Presencia de corpúsculos de Joest-Degen. **[Histopathology of Experimental Equine Encephalomyelitis caused by Argentine Virus].**—*Inst. Enferm. infecc., Fac. Agron. Vet., Univ. B. Aires.* **1.** No. 3. pp. 10. **1112**

The lesions in the central nervous system of horses infected with Argentine type E.E. virus were similar to those found in animals infected with the other types of this virus.

Joest-Degen bodies were found in the central nervous system of artificially infected horses, but not in sheep. The sheep is not very susceptible to the Argentine type of virus and the authors were thus able to study material from animals in the convalescent stage.—M. W.

CHOWN, B., & NORRIS, M. (1942). **Virus of Western Equine Encephalomyelitis in the Spinal Fluid.**—*J. Amer. med. Ass.* **120.** 116–117. **1113**

Case record of a six-week-old infant. Diagnosis was by inoculation of experimental animals and later by the detection of complement-fixing antibodies in the blood during recovery.—J. E.

*ROUBAUD, E., LÉPINE, P., TREILLARD, M., & SAUTTER, V. (1941). Infection expérimentale de culicides (Aedines) européens avec le virus de l'encephalomyélite équine américaine, type Venezuela. **[Experimental Infection of European *Aëdes* Mosquitoes with Equine Encephalomyelitis Virus from Venezuela].**—*Bull. Soc. Path. exot.* **34.** 130–133. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 450]. **1114**

It was found possible to infect mosquitoes with Venezuelan E.E. virus, as can be done with Eastern and Western U.S.A. virus types. European species of *Aëdes* could be infected by feeding on infected animals, and are in all probability capable of transmitting the infection.

Precautions are discussed to avoid accidental infection in research work such as occurred during the above work.

*LÉPINE, P., MATHIS, M., & SAUTTER, V. (1941). Infestation expérimentale de Triatoma infestans par le virus de l'encéphalomyélite équine américaine, type Venezuela. **[Experimental Infection of *T. infestans* with Equine Encephalomyelitis Virus from Venezuela].**—*Bull. Soc. Path. exot.* **34.** 115–118. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 449]. **1115**

Specimens of *T. infestans* were infected by being given complete feeds on g. pigs infected with the Venezuelan strain of E.E. virus. The bugs remained infected for 11 days and occasionally for 18 days, but their bites were never infective to animals. They are presumably, therefore, not to be regarded as potential vectors of E.E.

MASON, J. H., & ALEXANDER, R. A. (1941). **The Preservation of Horsesickness Vaccine with "Merthiolate".**—*J. S. Afr. vet. med. Ass.* **12.** 1–11. **1116**

The value of merthiolate was investigated as a preservative for the vaccine for horse sickness. A series of experiments was undertaken to find the optimum dilution which would preserve the virus in the vaccine and at the same time prevent bacterial growth under conditions such as would be encountered in the despatch of vaccine over varying distances under different climatic conditions. It was found that merthiolate in concentrations of 1 : 10,000–1 : 20,000 has no appreciable adverse effect on horse-sickness virus during a period of three months at 5°C. or 43 days at 17°–23°C., and in these concentrations it is a better bactericidal and bacteriostatic agent than ether. A concentration of 1 : 20,000 is apparently sufficient to destroy any chance contaminant in the vaccine. As a result of these experiments, merthiolate is now being used as a preservative in a dilution of 1 : 20,000.—E. M. ROBINSON.

POKORNÝ, W. (1941). Die Schutzimpfung bei Schweinepest und ihre Erfolge. **[Results of Immunization against Swine Fever].**—*Berl. Münch. tierärztl. Wschr.* Jan. 10th. 17–18. **1117**

A description of the successful application of the serum + virus method of immunization in seven herds of swine at a time after S.F. had appeared. Clinically affected pigs or those with pyrexia and all which had refused food for at least three days were slaughtered. Pigs in the earliest stage of infection were given serum alone and all the rest virus + serum in doses 25–50% above the normal doses.—J. E.

*DE GIER, C. J. (1941). Is de "Teschener Krankheit" (Schweinelähme, Encephalo-myelitis suum) een afzonderlijke ziekte of wordt ze veroorzaakt doo het virus van de varkenspest? **[Is Porcine Encephalomyelitis a Distinct Disease or is it Caused by Swine Fever Virus?]**—*Tijdschr. Diergeneesk.* **68.** 695–700 and 723–733. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 467]. **1118**

Speculation on clinical and pathological grounds. [Work has been done on differential diagnosis, whereby the two diseases are known to be distinct, see TRAUB —*V. B.* **12.** 275.]

KÖSER, A. (1942). Der derzeitige Geflügelpest-Seuchenzug. **[Current Outbreak of Fowl Plague in Germany].**—*Dtsch. tierärztl. Wschr.* **50.** 446–449. **1119**

A recapitulation of the reports by WAGENER and by TRAUB [*V. B.* **13.** 90.] of current outbreaks of a variation of fowl plague, which are provisionally diagnosed as Newcastle disease.—TJ. BAKKER.

MANNI, L. (1941). Peste e laringo tracheite aviare con particolare riguardo nella regione emiliana. **[Avian Laryngotracheitis in Emilia, Italy].**—*Nuova Vet.* **20.** 20–23. **1120**

[The journal containing the first part of this article has not, as far as is known, been received in the United Kingdom. The part now dealt with covers only the clinical account and M.'s investigations.]

M. reviews the subject of avian laryngotracheitis and describes an outbreak of disease among fowls in the province of Emilia. The disease attacked hens principally, and only occasionally pigeons, ducks and pheasants. Affected birds became weak and somnolent and emaciated and had pronounced anorexia. There was a thick mucus discharge from the nostrils, a diphtheritic membrane covered the pharynx, and diarrhoea was common. A notable feature was the rattling sound made by the birds in breathing. Some of the birds had nervous symptoms, varying degrees of paresis and paralysis being present. At autopsy various degrees of laryngotracheitis were found; the gizzard was usually much dilated and there was haemorrhagic inflammation of the glandular stomach.

Microscopic examination was negative for *Aspergillus*, *Pasteurella aviseptica* and protozoa. Cultures from heart blood, spleen, and marrow revealed colon-typhoid organisms, diplococci, and streptococci.

In M.'s opinion the variety of symptoms and lesions may be explained by the appearance of other fowl

diseases in birds already weakened by the virus of laryngotracheitis.—MILLER WATSON.

*VIANELLO, G. (1941). L'attuale epizoozia di laringo tracheite infettiva dei polli e le possibilità di protezione vaccinale. **[The Current Outbreak of Avian Laryngotracheitis in Italy and the Possibility of Immunizing against It].**—*Clin. vet., Milano.* **64.** 264–274. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 297]. **1121**

The avian epizootic raging in Italy during 1941 seemed to be identical with the American avian laryngotracheitis. Drug treatment including the use of sulphonamides, appeared to be useless. Preventive vaccination gave satisfactory results. Two vaccines were in use, one prepared from the internal organs of naturally infected birds, and another prepared from material taken from the tracheas of affected fowls.

—M. LANDAU.

*GÖNNERT, R. (1941). Über ein neues, dem Erreger des Lymphogranuloma inguinale ähnliches Mäusevirus. **[A New Mouse Virus Resembling that of Lymphogranuloma inguinale].**—*Klin. Wschr.* pp. 76–78. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 472]. **1122**

G. describes a new latently occurring pneumotropic virus in mice. It could be activated by intranasal inoculation so as to cause broncho-pneumonia. Morphologically it bears very close resemblance to the virus of lymphogranuloma inguinale.

GIROUD, P. (1942). Rickettsies et produits antigenes extraits du tissu où ont cultivé ces éléments. Intérêt de l'action simultanée de ces antigènes. **[Rickettsia and Antigens Extracted from Tissue in which Rickettsia have been Grown. Simultaneous Action of these Antigens].**—*Bull. Soc. Path. exot.* **35.** 199–202. **1123**

The lungs of mice inoculated with a rickettsia [presumably that of typhus] were pulped and then diluted with normal saline to which 2% formalin was added. The tissue cells and rickettsia were removed by centrifugation and the clear tissue extract tested for antigenic value when unheated and when heated to various temperatures. The antibody content of sera of animals treated with these extracts was tested by keeping the sera in contact with rickettsia for 1½ hours at 37°C., and then inoculating the mixture intradermally into rabbits. Tests were also carried out to ascertain the immunizing value of the extracts in g. pigs. It appeared that the heated extracts had little antigenic value, but the unheated extract free from rickettsia, and any of the extracts to which formolized rickettsial suspension was added, were efficient antigens.—U. F. RICHARDSON.

GUELIN, A. (1942). Action des rayons lumineux sur le bactériophage. **[Action of Light Rays on Bacteriophage].**—*Ann. Inst. Pasteur.* **68.** 245–248. **1124**

G. tested the effect of direct and indirect light rays from the sun on saline suspensions of two bacteriophages, S13 and C16, both of which are active against *Bacterium flexneri* Y. Tests were made under identical conditions in each case.

S13 was found to be inactivated quickly and often completely by sunlight. C16 was inactivated more slowly, and only partially after six hours' exposure.

Exposure of both strains to ultra-violet rays, of wave lengths of 3,400–4,000 Å, for 1½ hours was without effect on the virulence. Infra-red rays did not seem to play a very important part in the inactivation. The active rays were those of the visible part of the spectrum and appeared to be concentrated in the violet and blue regions.—ISOBEL W. BURTON.

See also absts. **1185**, **1186**, **1321** (rabies), **1314** (rinderpest), **1257** (laryngotracheitis), **1314** (rickettsia).

IMMUNITY

GOODPASTURE, E. W. (1940). **The Cell-Parasite Relationship in Bacterial and Virus Infection.**—*Trans. Stud. Coll. Phys. Pa.* **9.** 11–24. [Extracts from abst. in *Bull. Hyg., Lond.* **17.** 63, copied *verbatim.* Signed: WILSON SMITH]. **1125**

The author accepts the concept of cytotropism of viruses based upon the hypothesis of their exclusive multiplication within living cells and cites in support his own experiments on fowlpox and the Bollinger body and on the spread of rabies infection along neurones. The especial uses of the chick embryo technique of virus propagation are discussed.

It was found that some species of bacteria behave like viruses in utilizing living cells as media for growth and means of extension to other regions of the host organism. This host parasite relationship may even serve as an index of virulence of the parasite and as a basis for a biological classification. Thus, of several bacterial species studied, some proved to be almost exclusively extracellular parasites, some facultative epi- or intracellular parasites and some obligate intracellular parasites. For example, the diphtheria bacillus, *Staph. aureus*, *Strep. haemolyticus* and the pneumococcus find the extracellular fluids to be the only media affording them suitable conditions for growth in the egg, whereas *Strep. viridans* and the meningococcus multiply to some extent within the cytoplasm of certain living cells. Similar differences of behaviour and nutritional requirements were found with *Past. pestis*, *Bact. tularense* and *Br. abortus*. Moreover, those organisms which demand or prefer the living cell as a medium for growth show interesting cell specificities, *Bact. tularense* growing particularly well in ectodermal epithelium and *Br. abortus* in endothelium.

The author considers that these differences, revealed by chick embryo culture, are not artificial but representative of host parasite relations occurring under natural conditions. The necessity for the nutritional medium of certain cells may determine the utilization of a particular portal of entry and channel of invasion.

SPINK, W. W., AGNEW, S., & MICKELSEN, O. (1942). **Ascorbic Acid and Immunity. I. The Relation of Ascorbic Acid to Human Complement.**—*J. Immunol.* **44.** 289–296. **1126**

AGNEW, S., SPINK, W. W., & MICKELSEN, O. (1942). **Ascorbic Acid and Immunity. II. The Relation of Ascorbic Acid to Guinea Pig Complement.**—*Ibid.* 297–302. **1127**

SPINK, W. W., AGNEW, S., MICKELSEN, O., & DAHL, La M. (1942). **Ascorbic Acid and Immunity. III. The Effect of Ascorbic Acid upon the Bactericidal Action of Human Blood.**—*Ibid.* 303–308. **1128**

I. ECKER *et al.* (1938 & 39) claimed that in human beings and g. pigs the complementary activity of serum was related directly to the concentration of ascorbic acid, and could be raised by *in vivo* administration or *in vitro* addition of ascorbic acid. The findings of the present authors fail to confirm this.

Estimations of ascorbic acid content and complementary activity of sera were made in 24 human subjects before and after intravenous injection of ascorbic acid (200–1,000 mg.). A tremendous increase in ascorbic acid was unaccompanied by any change in complement

level. In a further four subjects, simultaneous estimates of complement were made by the authors' method and that used by Ecker, involving a change in the dilution fluid. No difference in results appeared. Neither *in vitro* addition of ascorbic acid to deficient serum (five cases) nor inactivation of ascorbic acid by the addition of small amounts of copper produced any variation in complementing power. When serum was heated at 56°C. there was a slight fall in the ascorbic acid content, but complement and bactericidal activity disappeared completely, as also happened when the pH was altered to 4·3 for 30 min. and then restored to normal.

II. Six g. pigs fed on scorbutogenic diets responded with a drop in ascorbic acid content of the serum, but no diminution of complementary activity was apparent. Addition of ascorbic acid to the deficient sera *in vitro* failed to raise their complement level. In these and later groups of animals, intramuscular injection of 100 mg. of ascorbic acid daily for several days somewhat raised the level of this substance in the serum, but not to normal, and again there was no change in complement level. The results were repeated in three other groups of six animals and one group of five animals kept for varying lengths of time on (a) a scorbutogenic diet, (b) a scorbutogenic diet + ascorbic acid supplements of varying amounts, and (c) fresh cabbage. The last usually raised the ascorbic acid value to the normal level.

III. The relationship between the bactericidal activity of blood and the ascorbic acid level was examined in human subjects before and after intravenous injection of ascorbic acid. No significant changes were apparent whether the organisms in the test were *Staphylococcus albus* (12 sera tested), *Bacterium coli* (eight sera), or *Salmonella typhi* (smooth H strain) (five sera). Similarly there was no decrease in bactericidal activity towards *Bact. coli* (12 sera), *S. typhi* (four sera) or *Bact. flexneri* (nine sera) when the ascorbic acid in the serum had been oxidized by small amounts of Cu, too small to affect the bactericidal or haemolytic functions of complement.

—E. J. M. HAYWARD.

KEMPF, A. H., & NUNGESTER, W. J. (1942). **Observations on Reversibility of the Quellung Reaction and Relation Between the Quellung Reaction and Bile Solubility.**—*J. infect. Dis.* **71.** 50–54. **1129**

A study was made of the conditions governing the reversibility of the Neufeld quellung reaction (swelling of the capsules in the presence of type-specific antiserum) of pneumococci suspended in saline after growth for 6–8 hours in 0·1% glucose broth, followed by centrifugation, washing with saline, and re-centrifugation to remove free polysaccharide in solution. The amounts of polysaccharide required to prevent or reverse this phenomenon, in the presence of a given amount of antiserum, were determined. A marked delay was demonstrated in the bile solubility, estimated by clearing of the suspension and by a viable count, of pneumococci in which the quellung reaction had occurred. The turbidity of a mixture of pneumococci and type-specific antiserum containing sufficient polysaccharide to prevent the quellung reaction, was only slightly greater than that in a tube containing only pneumococci and bile. A similar result was obtained with a pneumococcal suspension in which capsular swelling had disappeared after the addition of polysaccharide. Repeated washing of antiserum-treated pneumococci also reversed the quellung reaction.—R. O. MUIR.

ROTHEN, A., & LANDSTEINER, K. (1942). **Serological Reactions of Protein Films and Denatured Proteins.**—*J. exp. Med.* **76.** 437–450. **1130**

Films on prepared chrome slides were made with various proteins, *viz*, hen ovalbumin, horse and human serum albumin, and globulin. The increase in thickness of the film after treatment with homologous and heterologous antisera was measured. The proteins were found to react specifically with their antibodies. There was a marked specificity between mammalian and chicken albumins and a difference between human and horse albumins became manifest when the antisera were used in dilution.

Serum globulin films lost their reactivity when kept on the water surface, in contrast to the albumin films. This loss was delayed when the films were subjected to compression.

Films made with antibodies to pneumococcus types I and III specifically fixed the homologous polysaccharides.

Precipitin tests using immune sera for denatured hen ovalbumin against ovalbumin of other species again demonstrated species specificity.—E. J. M. HAYWARD.

MORTON, H. E., & GONZALEZ, L. M. (1942). **On the Site of Formation of Diphtherial Toxin.**—*J. Immunol.* **45.** 63–69. **1131**

Sonic extract of well washed bacterial cells of *Corynebacterium diphtheriae* produced reactions when injected intradermally into normal rabbits, but not when injected into rabbits previously immunized with diphtheria antitoxin. It also flocculated with standard flocculating diphtheria antitoxin.

From this it appears that one at least of the sites of formation of diphtheria exotoxin, if not the site of formation, is within the bacterial cell.—E. J. M. H.

EHRICH, W. E., & HARRIS, T. N. (1942). **The Formation of Antibodies in the Popliteal Lymph Node in Rabbits.**—*J. exp. Med.* **76.** 335–348. **1132**

The formation of agglutinins and haemolysins in the popliteal lymph node and its efferent and afferent lymph were investigated in rabbits which had received subcutaneous infections into the feet of typhoid vaccine and sheep erythrocytes. Changes in the lymph node and the output of cells from it were also noted. In a preliminary experiment with seven animals, antibodies remained at a low level at the site of inoculation and in the afferent lymph, but they rose in the lymph node, efferent lymph, and blood serum. The number of leucocytes in the afferent lymph averaged about 5,000 per ml. and in the efferent lymph about 67,000 per ml.

In further experiments involving 64 animals, inoculations were carried out and animals killed and examined on subsequent days. Antibodies appeared in the efferent lymph in 2–4 days and reached their maximum titre after six days. This followed a rise in the number of lymphocytes in the efferent lymph, and lymphatic hyperplasia occurred in the lymph node after preliminary infiltration of granulocytes and monocytes. This hyperplasia was first of a diffuse type, but this was later superseded by large so-called "germinal centres", the latter lagging somewhat behind the rise in antibody titre.

The authors consider that the evidence points to the lymphocyte as a factor in antibody response.

—E. J. M. HAYWARD.

HAUROWITZ, F., VARDAR, M., & SCHWERIN, P. (1942). **The Specific Groups of Antibodies.**—*J. Immunol.* **43.** 327–330. **1133**

The authors present experimental evidence incompatible with JORDAN's recently propounded "autocatalytic reproduction" theory of antibody formation, and suggest that the specificity of antibodies is better explained by their own generally accepted theory of "complementary structures", *i.e.* that antibodies are globulin molecules whose amino acids are adjusted to

the determinant groups of the antigen with regard to its structure and electric charge. [JORDAN suggested that injected antigen was split enzymatically, that the resultant products formed various combinations with different substances present in the injected organism; and that, on rare occasions, one of these combination compounds possessed the property of autocatalytic reproduction, this latter being identified with the antibody. The mathematical and physical arguments of Jordan's theory have been refuted lately by PAULING —*V. B.* **12.** 30.]—J. LOCHIEL MCGIRR.

KALMANSON, G. M., HERSHEY, A. D., & BRONFENBRENNER, J. (1942). **Factors Influencing the Rate of Neutralization of Bacteriophage by the Antibody.** —*J. Immunol.* **45.** 1–12. **1134**

Using an antiserum prepared against a highly purified coliphage and employing the phage counting method for estimation of the amount of phage, the authors found that a constant proportion of phage was neutralized, regardless of the concentration of phage actually present, and that the course of neutralization progressed at a logarithmic rate until 99% of the phage was neutralized. Neutralization of phage appeared to resemble a bimolecular reaction in which (if Poisson's law can be applied here) two antibody particles are required to neutralize one phage particle. Study of the relationship of serum concentration to rate of neutralization showed that the logarithm of the percentage of residual activity is inversely proportional to serum concentration, except in the higher concentrations of serum when more phage than would be expected remains unneutralized.

The rate of neutralization is 12–14 times faster at 37°C. than at 0°C., while change of pH between 5·0 and 10·0 has relatively little effect on the rate. Below pH 4·5 neutralization is markedly inhibited, but it returns to normal rate on readjustment of the pH to 7·0.

Identity of rates of neutralization of small and large particles appears to lend weight to the theory that phage of different size consists of small active molecules adsorbed to inert carrier particles of different sizes. —E. J. M. HAYWARD.

KALMANSON, G. M., & BRONFENBRENNER, J. (1942). **Evidence of Serological Heterogeneity of Polyvalent "Pure Line" Bacteriophage.**—*J. Immunol.* **45.** 13–19. **1135**

Antiserum was prepared against a polyvalent phage (PC) which was equally capable of acting on *Bacterium coli*, *Bact. shigae*, and *Bact. flexneri*. By careful neutralization the "valencies" for the last two organisms could be neutralized and a monovalent phage capable of acting on *Bact. coli* only obtained. Propagation of this phage on *Bact. coli* immediately restored its original powers. The rate of neutralization of the *Bact. coli* valency was slower than that of the *Bact. shigae* valency. It appears unlikely that this difference is due to a difference in the number of antibody molecules required to neutralize the different valencies.—E. J. M. HAYWARD.

LUIPPOLD, G. F. (1942). **Typhoid Vaccine Studies. V. Studies on the Relationship between the Antigenic Content and the Immunogenic Properties of Bacterial Suspensions.**—*Amer. J. Hyg.* **36.** 354–361. **1136**

The immunizing properties of formolized vaccines prepared from antigenically complete, virulent and avirulent, strains of *Salmonella paratyphi*, from an antigenically deficient strain, from certain components of the para-A antigenic complex and from the complete para-A O-antigenic complex improvised from generically alien organisms (*Eberthella* and *Escherichia*) known to contain recognized *Salmonella* antigens, were compared by vaccinating groups of four mice intraperitoneally and testing for immunity to graded doses of various strains of *S. paratyphi* six days after vaccination. A similar comparison was made of the immunogenic properties of the natural antigenic complex of a virulent strain of *S. schottmülleri*, of certain components of the para-B antigenic complex and of the complete O-antigenic complex of para-B improvised from two generically alien organisms (*Eberthella* and *Escherichia*) against graded doses of *S. schottmülleri*. A few determinations made with pure O-antigen vaccines indicated that results obtained were essentially the same as those obtained with the formolized whole product.

From the results of these comparisons, L. was unable to state the degree of relationship, or the conditions governing correlation, between antigenic content and immunogenic properties of bacterial suspensions, but concluded that, more than identity or quantity, the quality of contained antigens appears to be the most important factor in the selection of an organism as a vaccine culture.—R. O. MUIR.

FREUND, J., & BONANTO, M. V. (1942). **The Effect of the Amount of Antigen on Antitoxin-Formation During the Primary and Secondary Immunizations.** —*J. Immunol.* **45.** 71–78. **1137**

Forty rabbits were subjected to two courses (separated by one month or more) of intravenous injections of alum-precipitated diphtheria toxoid, varying in dosage from 25 Lf. to 10,000 Lf. and the antitoxin response was measured. The response to different doses in the first course was similar in all rabbits, but the same dose had a much greater effect in the second course than in the first and here the rise in antitoxin increased with increasing dosage of toxoid up to 5,000 Lf. The antitoxin content of the serum fell rapidly again even before the second course was completed, the fall being greatest with the greatest doses. The sum of the stimuli from small doses in the second course did not have such a great effect as that from one large dose.—E. J. M. H.

GRABAR, P., & OUDIN, J. (1942). Essai d'immunisation par injection d'un précipité spécifique. **[Attempt at Immunization by Injection of a Specific Precipitate].** —*Ann. Inst. Pasteur.* **68.** 166–168. **1138**

Specific precipitates, formed by the action of homologous equine immune serum on type VIII pneumococcal polysaccharide in the zone of excess hapten, were used in these experiments. The precipitates were washed twice in saline and injected into rabbits in five series of four equal daily doses. Two rabbits were inoculated with gradually increasing doses of precipitate and three rabbits were inoculated with precipitate suspended in saline containing type VIII polysaccharide in a quantity representing five times that of the precipitate. Injections were made intravenously in the first three series and subcutaneously in the last two. Animals were bled eight days after the second series and eight days and two months after the end of the fifth series. None of the resulting sera formed a precipitate with polysaccharide. This absence of antigenic power may be due to the fact that the structure of the hapten-antibody complex does not satisfy the conditions for antigenicity, or may be due to its not persisting long enough in the organism in the combined form. —ISOBEL W. BURTON.

SAKO, W. S. (1942). **Resistance to Infection as Affected by Variations in the Proportions of Protein, Fat, and Carbohydrate in the Diet. An Experimental Study.** —*J. Pediat.* **20.** 475–483. **1139**

Groups of young albino mice were fed for six weeks on diets containing varying proportions of protein,

carbohydrate, and fat, and fixed amounts of cod liver oil, yeast powder, and salt mixture. All proportions of protein, carbohydrate, and fat at high, medium, and low levels were represented. A control group received an adequate commercial food mixture for six weeks. All mice were then inoculated subcutaneously with many times the lethal dose of virulent pneumococci. The post-inoculation survival time was taken as a measure of resistance to infection. The most significant result was that concerning the effect of protein. The groups receiving 60% and 55% protein survived for average times of 43 and 45 hours respectively, compared with 21 hours for the 4·5% protein group, and 32–35 hours for two 20% protein groups and the control group. Variations in the proportions of carbohydrate did not affect the results significantly, but high fat (53%) appeared to be inferior to high carbohydrate (78%) at the 10% protein level, the respective average survival times being 22 hours and 37 hours. It is concluded that prolonged use of a very low protein diet (*e.g.* 4·5%) decreases resistance, while an intake three times as great as that usually considered optimal for general nutrition actually increases resistance to infection.—D. G. GILMOUR.

See also absts. **1022** (anthrax), **1027** TB.), **1049** (pullorum disease), **1057–1059** (brucellosis), **1069** (toxins of actinobacillus, **1095** (virus infections), **1096**, **1097** (foot and mouth disease), **1099** (rabies), **1117** (swine fever), **1121** (laryngotracheitis), **1123** (rickettsia), **1168** (fowl leucosis), **1083** (fowl malaria), **1092** (leptospirosis), **1085** (placental barrier).

PARASITES IN RELATION TO DISEASE [GENERAL]

SENEKJIE, H. A., & SCOTT, L. C. (1942). **Studies on the Microcataphoresis of Animal Parasites.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 174–175. **1140**

Encysted and unencysted forms of parasitic protozoa, and eggs, larvae, and adults of parasitic nematodes were subjected to an electric current in a cataphoresis cell. All the forms tested drifted to the positive pole. It is concluded that these parasites are all negatively charged, and since bacteria are also negatively charged, it would not be possible to purify cultures (*e.g.* of *Entamoeba histolytica*) by electrolytic means.—D. G. GILMOUR.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

JOHNSON, C. G. (1942). **Insect Survival in Relation to the Rate of Water Loss.**—*Biol. Rev.* **17.** 151–177. **1141**

A review and re-analysis, by improved methods, of the principal work on the relation between insect survival and atmospheric humidity. It is pointed out that there is no general and simple law relating either survival or water loss to saturation deficiency, although they seem to be more closely correlated with this than with any other measure of humidity. Curves for longevity against saturation deficiency are examined in the cases of various insects and of *Ixodes ricinus*. J. states that survival of *I. ricinus* may be limited by water loss over a wider humidity range than MACLEOD believed [*V. B.* **6.** 137]; high humidities do apparently have an adverse effect on vitality, although MacLeod supposed that they did not. [This is important in connexion with current control experiments aimed at killing *I. ricinus* on pastures. There is need for further study of the humidity and other conditions within the coats of domestic animals in relation to external parasites such as sheep maggots, lice, keds, ticks, etc.]
—A. MILNE.

CHORLEY, J. K. (1942). **Tsetse Fly Operations, 1941. Short Survey of the Operations by Districts for the Year Ending December, 1941.**—*Rhod. agric. J.* **39.** 231–235. **1142**

During 1940 the zones covered by anti-tsetse operations in Rhodesia were pushed forward to give additional protection to the ground already recovered from tsetse, estimated at over 6,000 sq. miles, and 1941 was devoted mainly to consolidation of the newly occupied advanced positions. Native cattle have continued to increase in all areas previously cleared of tsetse, and in some cases the demand for new grazing has resulted in native cattle being pushed forward into areas of retreating fly with embarrassing precipitancy. A large scheme of native settlement in the Urungwe Native Reserve was to be carried out in 1942, and also a scheme for post-war European settlement is being planned for this area, and here a considerable increase has been made in the number of native hunters. Two new roads have been cut, dips sited, medical centres provided, and schemes of soil and water conservation prepared.

Over 20,000 game animals have been destroyed during the year. The position in restocked areas appears to be satisfactory, but there has been an extension of *G. morsitans* toward the Rhodesian border from Portuguese territory, and in the Melsetter area there have been suspected outbreaks of trypanosomiasis on 33 farms.

By the courtesy of the Portuguese authorities a rapid survey of conditions in the neighbouring Portuguese territories has been made by Rhodesian and South African officials.—U. F. RICHARDSON.

KOMÁREK, J., & BREINDL, V. (1941). Das heutige Verhältnis Anopheles-Tier-Mensch in Mitteleuropa. **[Relationship of *Anopheles*, Animals and Man in Central Europe To-Day].**—*Z. angew. Ent.* **28.** 501–506. **1143**

An account of field observations in Bohemia and Moravia during 1940 on the mosquitoes, *Anopheles maculipennis* var. *typicus*, *A. m. messaea*, and *A. bifurcatus* (*claviger*).

The authors conclude that the mosquitoes studied feed indiscriminantly on man and domestic animals. Small, dark, poorly ventilated cattle sheds offer ideal environmental conditions and attract the mosquitoes. The association of mosquitoes with such cattle sheds and therefore with a plentiful supply of hosts, reduces their chances of feeding on man and so limits the possibility of their transmitting malaria. In support of this view, it is pointed out that many soldiers suffering from malaria returned to this area after the Great War, but no outbreaks of malaria occurred.—J. B. CRAGG.

STEINHAUS, E. A. (1942). **Note on a Toxic Principle in Eggs of the Tick, *Dermacentor andersoni* Stiles.**—*Publ. Hlth Rep., Wash.* **57.** 1310–1312. **1144**

In g. pigs given intraperitoneal injections of 1–2·5 ml. of triturated eggs of *D. andersoni*, characteristic toxic symptoms developed, death usually occurring within 2–3 days. The reactions in rabbits and mice were similar but less consistent. The eggs of *D. andersoni*, in containing a toxin, are therefore similar to those of other species of tick studied [see *V. B.* **9.** 163 and 714]. The active principle was filtrable, was resistant to drying, alcohol, and acetone, and was apparently non-dialysable. S. is not prepared to suggest that the toxic principle contained in the eggs is the one respons-

ible for cases of tick paralysis caused by *D. andersoni*. —J. B. CRAGG.

EWING, H. E. (1942). **Remarks on the Taxonomy of Some American Chiggers (Trombiculinae), Including the Descriptions of New Genera and Species.**—*J. Parasit.* **28.** 485–493. **1145**

E. has had opportunity to examine specimens and material from Brazilian fowls infested with *Apolonia tigipioensis* Torres & Braga, 1938. This chigger enters the quills of very new feathers and produces nodules and lesions. The infested quills break off near the base, each broken base containing a single mite which completely fills its lumen. E. considers that, should this parasite spread to other countries, it may become a poultry pest of major importance.—E. S.

See also absts. **1073, 1074** (vectors of trypanosomiasis), **1087, 1088** (of piroplasmosis), **1089** (of theileria), **1258–1262, 1276** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

LUCKER, J. T. (1941). **Climate in Relation to Worm Parasites of Livestock.**—*Yearb. U.S. Dep. Agric., 1941.* pp. 517–527. **1146**

L. refers to the influence of climatic conditions (moisture, temperature, and sunlight) on the distribution and development of the parasites of livestock, by controlling the development of their eggs and larvae. He also refers to the indirect influence of climate, by limiting the distribution of the intermediate hosts. The use of these factors in the control of animal parasites is discussed.—T. E. GIBSON.

MÖNNIG, H. O. (1941). **Measles in Cattle and Pigs: Ways of Infection.**—*J. S. Afr. vet. med. Ass.* **12.** 59–61. **1147**

The freshly passed, ripe segments of *Taenia solium* are rather flabby, fragile, and inactive, and probably remain close to the faeces so that the eggs are not quickly disseminated. Pigs are therefore likely to pick up a heavy infection when they get access to fresh human faeces. Universal use of latrines would be of great value in limiting the spread of *T. solium* in Africa as the segments are only passed with the faeces. The ripe segments of *T. saginata* are firm and active, crawling about like caterpillars and expelling eggs on the way. The segments may be passed spontaneously and not necessarily during defecation. They and their eggs may therefore be widely disseminated, and hence infections of cattle are usually light, though in calves they are sometimes heavy. Strict use of latrines will not stop the spread of this tapeworm. Infection with "measles" in cattle will prevent a subsequent infection, but this immunity is of no practical value on account of the long life of the cysticerci.—E. M. ROBINSON.

ANDREWS, J. S., & CONNELLY, J. W. (1942). **Early Natural Infections of Suckling Pigs with Helminth Parasites.**—*Proc. helminth. Soc. Wash.* **9.** 56–57. **1148**

P.M. examinations of 17 unweaned pigs, a few hours to 66 days old, revealed a mature female *Strongyloides ransomi* in a 4-day-old pig, a live exsheathed third-stage larva of *Stephanurus dentatus* in the body muscle tissue of a 12-day-old pig, and eggs of *Oesophagostomum* sp. in the faeces of a 42-day-old pig. The sows had been farrowed under conditions of partial sanitation.—M. L. BINGHAM.

SPINDLER, L. A., & HILL, C. H. (1942). **Death of Pigs Associated with the Presence in the Heart Tissue of Larvae of *Strongyloides ransomi*.**—*Proc. helminth. Soc. Wash.* **9.** 62–63. **1149**

Some young pigs died suddenly two weeks or more after experimental infection with *S. ransomi*. In each case, third-stage *Strongyloides* larvae were found in the myocardium in the region of the auriculo-ventricular node and bundle, and a thrombus, firmly adherent to the endocardium, was present in one or both ventricles. It is suggested that *S. ransomi* may, under certain conditions, be responsible for sudden death in pigs and that *S. stercoralis* may cause a similar condition in man. —M. L. BINGHAM.

ALLEN, R. W., & WEHR, E. E. (1942). **Earthworms as Possible Intermediate Hosts of *Capillaria caudinflata* of the Chicken and Turkey.**—*Proc. helminth. Soc. Wash.* **9.** 72–73. **1150**

In order to obtain eggs of *Capillaria annulata*, earthworms (species undetermined), which were collected from an area inhabited by turkeys known to be infected with *C. annulata* and *Syngamus trachea*, were fed to young chicks. The chicks did not become infected with *C. annulata*, but *Capillaria* eggs present in their faeces proved to be those of *C. caudinflata*. This species was also recovered from turkeys kept on the same area from which the earthworms were collected, and it is here recorded for the first time from turkeys in the U.S.A. Although additional tests showed that young poults and chicks became infected with *C. caudinflata* as a result of having been fed earthworms, it was not determined whether the latter act as mechanical carriers or as true intermediate hosts.—M. L. B.

SCHOOP, G. (1942). Verbreiten die deutschen Edelpelztierzuchten die Trichinellen? **[Do German Fur Animal Colonies Spread Trichinella?]**—*Tierärztl. Rdsch.* **48.** 311–313. **1151**

Examination over a five-year period of large numbers of carcasses of fur-bearing animals from German breeding establishments showed the incidence of trichinosis in these animals to be low. Only occasional infestations were met with in the silver fox and raccoon, while mink and beaver appeared to be completely free. Carcasses of wild foxes and badgers constituted the chief source of infection. The new regulations [see *V. B.* **12.** 499.] forbidding the feeding of uncooked fox carcasses or other uncooked meat should avert the danger of spread of trichinosis in captive fur-bearing animals [see also *V. B.* **12.** 596].—H. E. HARBOUR.

MCCOY, O. R. (1942). **The Incubation Period of Trichinosis.**—*Amer. J. trop. Med.* **22.** 313–317. **1152**

The author summarizes the recent literature concerning the incubation period of trichinosis and includes his own observations upon an outbreak which occurred in Rochester, N.Y., in 1937. He confirms the view that the incubation period is very variable. In 156 cases in which this period could be computed, it was 22 days or less in 98% of the cases; the shortest and longest periods recorded were two and 27 days respectively. These figures indicate that there is no close correlation between the clinical course of the disease and the life-cycle of *Trichinella spiralis*; the appearance of symptoms seems rather to be related to the building up of a toxic condition than to the activities of the migrating larvae in the body.—M. L. BINGHAM.

ROGERS, W. P. (1941). **The Metabolism of Trichinosed Rats During the Early Phase of the Disease.**—*J. Helminth.* **19.** 87–104. **1153**

Four rats were experimentally infected with *Trichinella spiralis* and the effect on protein and crude fibre digestion and on the chief urinary constituents was investigated. Diarrhoea and anorexia occurred during the period 8–12 days after infection, at which time

protein digestion fell to its lowest level, an effect which was probably due to mechanical damage in the intestinal mucosa caused by the adult parasites. The urinary excretion of nitrogen, urea and creatinine rose immediately after infection, then dropped for a few days, and finally rose again sharply. No consistent effect on crude fibre digestion was obtained. R. speculates regarding the significance of, and possible reasons for, these variations.—J. LOCHIEL MCGIRR.

KOLBE, F. (1942). Bemerkenswertes über Trichinen, Trichinose und Trichinenschau. **[Notes on Trichinae, Trichinosis, and Trichina Inspection].**—*Z. Fleisch- u. Milchhyg.* **52.** 269–271. **1154**

This article consists of a series of quotations from other authors on various points of interest connected with trichinosis, together with comments thereon. Sex differentiation in muscle trichinae, morphology, the fox as a host, trichinae in heart muscle, and the influence of concurrent diarrhoea on the establishment of an infestation, are among the subjects so discussed. The article concludes with data which purport to show that no expense is spared in the Reich to eliminate trichinosis in the interests of public health, and this attitude is compared with that of the U.S.A., where general meat inspection for trichinosis is regarded as too costly and reliance is placed on refrigeration. The article shows political bias in the manner in which this point is discussed.—H. E. HARBOUR.

WYRENS, R. G., TILLISCH, J. H., & MAGATH, T. B. (1941). **Trichinosis. Report of Nineteen Cases of Clinical Infection and Twenty-One Cases of Asymptomatic Infection.**—*J. Amer. med. Ass.* **117.** 428–432. **1155**

The clinical symptoms in 19 cases are briefly described. The 21 symptom-free cases were diagnosed incidentally P.M., during routine examination of surgical pathological material; in none of these cases could any history be obtained of an illness that could be attributed to trichinosis. Among the clinical cases, two were suggestive of repeated infection; the question of immunity in man is briefly referred to.

KATES, K. C. (1942). **Observations on Fatalities in Sheep caused Primarily by Heavy Natural Infections with the Stomach Worm,** *Haemonchus contortus.*—*Proc. helminth. Soc. Wash.* **9.** 57–60. **1156**

Ante-mortem and *post-mortem* observations are reported on five lambs and one ewe, which died or were destroyed *in extremis* primarily from heavy natural infections with *H. contortus*. The sheep showed symptoms of severe anaemia associated with progressive loss of weight and appetite. The species and number of parasites recovered are tabulated; although ten other species were found they were, in general, of secondary importance, the most striking feature being the mass of *H. contortus* present in the abomasum. Of 19,650 parasites recovered from the ewe, 17,850 were *H. contortus*. The numbers of this species recovered from the lambs varied from 14,520 to 3,309, the smaller number being correlated with a relatively longer period of survival.—M. L. BINGHAM.

CASSAMAGNAGHI, A. (1942). El genero Cooperia en los bovinos—rol patogeno—dos nuevas especies en el Uruguay. **[The Genus** *Cooperia* **in Cattle in Uruguay].**—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 179–184. **1157**

C. describes *C. oncophora* and *C. punctata* from the stomach and small intestines of bovine animals.

This is the first time these two species have been recorded in Uruguay.—MILLER WATSON.

PORTER, D. A., & CAUTHEN, G. E. (1942). **Experiments on the Life History of the Cattle Lungworm, Dictyocaulus Viviparus.**—*Amer. J. vet. Res.* **3.** 395–400. **1158**

Artificial infection of calves with infective larvae of *D. viviparus* was carried out. The prepatent period was observed to be 24–30 days and the maximum numbers of larvae were passed 5–7 weeks after appearance of first-stage larvae in the faeces. The duration of the infection was 1–4 months. Prenatal infection was not set up in a calf by feeding the pregnant cow with a total of 30,600 infective larvae over a period of one month, ending two weeks before parturition. Reinfection was established in a previously infected 4½-month-old calf, but in one of two older calves reinfection was not set up and in the other only a light infection resulted. Respiratory symptoms and retardation of growth were observed when young animals were infected, but no symptoms were shown in older animals. The authors conclude that the life-history of *D. viviparus* is essentially similar to that of *D. filaria* as described by KAUZAL and others.
—T. E. GIBSON.

PORTER, D. A. (1942). **On the Survival of the Preparasitic Stages of the Cattle Lungworm on Pastures.**—*Proc. helminth. Soc. Wash.* **9.** 60–62. **1159**

In one experiment a pasture, that had been grazed by calves infested with *Cooperia punctata*, *Nematodirus helvetianus*, *Ostertagia ostertagi*, *Trichostrongylus colubriformis*, and *Dictyocaulus viviparus*, was divided into two areas. Three worm-free calves were introduced into one of the areas 43, 49, and 56 days respectively after the removal of the original calves. They remained on the area for one month, but none became infected with lungworms. Two other calves were put on the second area 148 and 155 days respectively after the original animals had been removed. Neither of these showed evidence of lungworm infection, although *C. pectinata*, *N. helvetianus*, and *O. ostertagi* were found in the calves in both tests. Some of the calves born into the original herd after it had been moved to new quarters did become infected with lungworms picked up from the other infected calves.

In a second experiment, faeces containing *D. viviparus* were distributed on two plots, which had been grazed solely by horses for several years. One calf was placed on each plot seven and 48 days respectively after contamination. Evidence of lungworm infection was found in one of the calves introduced after seven days, but in neither of those introduced after 48 days.
—M. L. BINGHAM.

HONESS, R. F. (1942). **Lungworms of Domestic Sheep and Bighorn Sheep in Wyoming.**—*Bull. Wyo. agric. Exp. Sta.* No. 255. pp. 24. **1160**

Lungworm disease of domestic sheep, due to *Dictyocaulus filaria*, is relatively unimportant in Wyoming. Among wild (bighorn) sheep, other lungworms, *Protostrongylus rushi* and *P. frosti* n. sp., cause damage; detailed descriptions are given of the parasites and of their bionomics.—H. E. HARBOUR.

KRÜGER, F. (1940). Die Beziehung des Sauerstoffverbrauches zur Körperoberfläche beim Schweinespulwurm (Ascaris lumbricoides). **[Relation between Oxygen Consumption and Body Surface in** *A. lumbricoides***].**—*Z. wiss. Zool.* **152.** 547–570. **1161**

The surface of the worms was determined in the following way. A metal plate was provided with a number of different holes having diameters of 1–6 mm., each hole differing by 0·2 mm. The worm was gently pushed through the different holes and the length of worm protruding measured. In this way a number of truncated cones was obtained, the surface of each of which could be calculated. The experimentally obtained

data agree satisfactorily with the data obtained by the use of Meeh's formula. It was found that the O_2 uptake approaches linearity more closely when related to the surface than when related to the weight of the worm. The whole question of animal size and metabolism is reviewed in some detail.

[The relevant result that, in *Ascaris*, O_2 uptake is more closely related to surface than to weight loses somewhat in importance when the following facts are realized :—(1) that very considerable individual variations exist, (2) that out of 71 measurements recorded in figure 2, only 21 (mostly favourable for the conclusions arrived at) were included in the table from which the conclusions were derived, and (3) that the O_2 uptake chosen for comparison, especially in the larger worms, was always the maximal O_2 uptake, " in order not to disturb the homogeneity of the numerical material ".]
—H. LASER.

WEHR, E. E. (1942). **The Occurrence in the United States of the Turkey Ascarid, *Ascaridia dissimilis*, and Observations on its Life History.**—*Proc. helminth. Soc. Wash.* **9.** 73–74. **1162**

This is the first record of the occurrence of *A. dissimilis* in the wild turkey in the U.S.A. This nematode is slightly smaller than *A. galli* from which it can be differentiated by the position of the fourth pair of ventral papillae of the male. Domestic turkey poults were infected by the ingestion of infective *A. dissimilis* eggs, two months or longer being required for the worms to mature in this host.—M. L. BINGHAM.

BAUMANN, R., & KMENT, A. (1941). Ueber das Vorkommen und die pathogene Bedeutung der Onchocerca reticulata. [**Occurrence and Pathogenic Importance of *O. reticulata***].—*Z. InfektKr. Haustiere.* **58.** 94–104. **1163**

The authors record the occurrence in Turkey of *O. reticulata* in tendon sheaths adjacent to the carpal joint of a mule and in Germany in a case of fistulous withers. The mule had been lame and there was tendinitis. It is suggested that this parasite may have spread into Germany from India and Russia by way of Turkey, Bulgaria, and Hungary.—H. E. HARBOUR.

See also absts. **1263** (anthelmintics), **1284** (technique).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

INNES, J. R. M. (1942). **Neoplastic Diseases of the Testis in Animals.**—*J. Path. Bact.* **54.** 485–498. **1164**

Fifty-two testicular tumours, one from a calf, two from horses, and 49 from dogs, are described and classified according to their histological features, the classification being similar to that adopted for testicular tumours in man. Enlarged testicles from three cryptorchid horses were also examined but were considered to be merely enlarged, cystic, retained testes and not true teratomas.

The testicular tumours in the dogs are classified as seminoma (32), tubular adenoma (15), and interstitial cell tumour (2). The characters of seminoma and interstitial cell tumour are already well known, but little attention has been paid either in human or veterinary pathology to tubular adenoma (Sertoli-cell tumour). The benign character of these growths is suggested by the fact that four dogs were alive and well more than two years after operative removal.

A follow-up of 14 dogs subjected to orchidectomy for seminoma provided no evidence of metastatic spread and it seems that this tumour is of low grade malignancy as compared with the corresponding tumour in man.

The testicular tumours in horses comprised one teratoma and one seminoma. The tumour in the calf was classified as a benign interstitial cell tumour.

The various types of tumour are illustrated by 16 photographs.—E. G. WHITE.

DURAN-REYNALS, F. (1942). **The Reciprocal Infection of Ducks and Chickens with Tumor-Inducing Viruses.**—*Cancer Res.* **2.** 343–369. **1165**

Ducklings were successfully infected with the Rous sarcoma agent by injection of large doses of virus within 24 hours of hatching ; 24 of 109 ducklings developed lesions following the inoculations. Within 30 days of inoculation the ducks developed solitary sarcomas resembling the Rous sarcoma of fowls. After a period of several months, three different types of sarcoma as well as one lymphoblastoma developed. Extracts of the growths which developed at an early stage (up to 30 days) produced typical Rous sarcoma in fowls but were without effect in ducks ; on the other hand, the late sarcomatous growths could not be transmitted to fowls but were infective for ducks, in which they produced a generalized disease characterized by periosteal sarcomas. Further evidence of variation of the Rous sarcoma virus was obtained by repeated passage of tumour cells through young ducks, the chick strain of virus becoming gradually converted into the duck strain and losing its virulence for the chick whilst becoming more virulent for ducks and producing a generalized disease. It was also possible by repeated passage in chicks to convert the virus from two duck variants into a virus which became increasingly virulent for chicks and eventually produced early lesions in the form of periosteal sarcomas, and late effects which included leucoses and osteopetrosis.

These findings illustrate the instability and capacity for variation of the Rous sarcoma virus and may well serve to reconcile the opposing views as to the unity or plurality of viruses inducing leucoses and tumours. This work also confirms the lack of species-specificity of avian tumours, contrary to the view held for so long.
—E. G. WHITE.

ZAPL, P. A., HUTNER, S. H., SPITZ, S., SUGIURA, K., & COOPER, F. S. (1942). **The Action of Bacterial Toxins on Tumors. I. Relationship of the Tumor-Hemorrhagic Agent to the Endotoxin Antigens of Gram-Negative Bacteria.**—*Amer. J. Hyg.* **36.** 224–242. **1166**

Many workers have reported that culture filtrates or suspensions of certain bacteria when injected into animals bearing tumours may cause severe haemorrhage at the site of the tumour, with but slight haemorrhage elsewhere. This haemorrhagic effect has been demonstrated with transplanted, tar-induced, and certain spontaneous tumours. The authors studied nearly 100 strains of bacteria representing a number of principal genera and they find that organisms producing tumour-haemorrhagic factors are characterized by the following features :– they are Gram-negative, they contain complex endotoxin antigens, and they all exhibit a type of pathogenesis characterized by vascular damage, disturbances in carbohydrate metabolism, and intestinal irritation.—E. G. WHITE.

COPISAROW, M. (1942). **The Bio-chemical Control of Cancer. Part I. The Combined Biotherapy of Cancer.**—*Edinb. med. J.* **49.** 425–428. **1167**

C. quotes recent work tending to support the

method which he suggested in 1934 for the control and treatment of cancer [see also LEWISOHN *et al.*—*V. B.* **12.** 45 and 298]. This consisted of the oral administration of baker's yeast in an enzyme-bearing nutrient medium, together with the injection of labile sulphoxide compounds. C. also suggests a method of purification of carcinogenic mineral lubricating oils which cause industrial skin cancer. The proposed method involves extraction of the oil with liquid sulphur dioxide followed by treatment with sodium tetrathionate or sodium thiosulphate.—E. G. WHITE.

LEE, C. D. (1942). **Studies on the Production of Specific Antibodies Against the Agent of Fowl Leucosis.**—*Amer. J. vet. Res.* **3.** 336–341. **1168**

The experiments recorded purport to show that the blood of fowls with leucosis, and saline suspensions and Berkefeld filtrates of nerve tissue of fowls with neurolymphomatosis, when injected into ducks and turkeys, stimulate the production of protective antibodies which neutralize the infectivity of leucotic blood and neural tissue extracts. Serum prepared against the former contained antibodies which conferred protection against the latter.

[A critical analysis of the recorded results is not possible since L. does not state upon what evidence he bases a positive diagnosis, and does not give P.M. findings.

It is stated that there is general agreement on the transmissibility of neurolymphomatosis. This may be so. There is, however, no general agreement that nerve tissue forms a suitable inoculum for the transmission of the disease. It is surprising that filtrates of nerve tissue and 1 : 1,000 saline suspensions should be sufficiently rich in infecting agent to act as an antigen in the production of protective antibodies].—F. D. ASPLIN.

See also absts. **1264** (avian leucosis), **1285** (technique).

DISEASES, GENERAL

LYASHENKO, P. T. (1940). Nashi metody ozdorovleniya zhivotnovodstva v raïone. [**Methods of Disease Control in the Novoaleksandrovsk Region**].—*Sovyet. Vet.* No. 5. pp. 5–7. **1169**

The history of the development of veterinary education in the province is given. The absence of control of the movement of cattle favours the spread of such diseases as brucellosis, with very severe results. At the end of 1938 a great educational drive for brucellosis control was started throughout the province with lectures, the distribution of pamphlets, etc. Veterinary stations were provided at suitable points together with "disinfection centres" [presumably a disinfection unit was sent to a farm when required]. Every animal in the province was examined as rapidly as possible [presumably serological or abortin tests were carried out]; movement of cattle without a pass was prohibited, and quarantine and inspection of animals coming from other districts was made compulsory. In this way the whole region was rapidly freed from brucella infection. Equally drastic steps (prophylactic measures, mechanical cleansing, disinfection, etc.) were also taken to eliminate "siberian wounds", swine erysipelas, etc. The working of the region's extensive veterinary organization is discussed.—E. R. PARISER.

ENIGK, K. (1942). Die Empfänglichkeit des Elenantilope für Anaplasma ovis und Eperythrozoon ovis. [**Susceptibility of the Eland to Infection by *Anaplasma ovis* and *Eperythrozoon ovis***].—*Dtsch. tropenmed. Z.* **46.** 48–52. **1170**

An eland was kept under observation for three months without the detection of blood parasites, and the inoculation of 10 ml. of its blood into a susceptible sheep failed to produce a parasitic infection. It was then inoculated with 10 ml. of the blood of a sheep infected with *Anaplasma ovis* and *Eperythrozoon ovis*. No clinical or parasitic reaction developed, but 10 ml. of its blood taken 51 days later and injected into a sheep led to the appearance of infection with *E. ovis* in 24 days and with *A. ovis* in 27 days. The role of game as carriers of anaplasms is discussed, and it is suggested that they are the natural hosts of these parasites, as evidenced by their failure to give any clinical reaction to infection.—U. F. RICHARDSON.

JONES, T. C., & MAURER, F. D. (1942). **Heredity in Periodic Ophthalmia.**—*J. Amer. vet. Med. Ass.* **101.** 248–249. **1171**

This study is confined to horse families, comprising 20 sires, 56 dams and 368 offspring, at the U.S. Army remount depot, Front Royal, Virginia from 1928–40. The incidence of periodic ophthalmia among these animals was 46 foals (only 12 the progeny of affected sire or dam), two sires, offspring of only one of which developed the disease, and ten mares, the foals of only six of which developed the disease. Infection was more than twice as great among foals whose sires were free from the disease as in those with affected sires, and the unaffected mares produced only a slightly lower percentage (15·6) of diseased foals than the affected mares (18·4). It is concluded that heredity plays no part in periodic ophthalmia.—C. V. WATKINS.

*SIEBERS, A. (1942). Statistische Erhebungen über den Hauptmangel "Kehlkopfpfeifen" zusammengestellt nach Tagebüchern (1895 bis 1939) der Medizinischforensischen Klinik der Ti. Ho. Hannover. [**Statistics on Roaring in Horses (Hanover Veterinary School Clinic Records)**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 371]. **1171a**

The records show that roaring was much more common in tall riding horses than in smaller horses, other factors such as sex being unimportant, although roaring predominated in geldings.—M. LANDAU.

CORNER, H. H. (1940). **The Fight against some Sheep Diseases in the South-Eastern Counties of Scotland.**—*Scot. Fmr Album 1940.* pp. 36–38. **1172**

An article written for farmers.—H. E. HARBOUR.

REVNIVYKH, A. (1940). K voprosam etiologii, kliniki i patogeneza letne-osennikh zabolevanii severnykh oleneï. [**Aetiology, Symptomatology, and Pathogenesis of "Summer and Autumn Affection" of Reindeer**].—*Sovyet. Vet.* No. 2–3. pp. 59–65. **1173**

Different clinical pictures were obtained when reindeers were infected intravenously, subcutaneously, intracutaneously, or *per os* with "*B. necrophorus rangiferis tarandi*". The disease occurs in different forms spoken of as summer and autumn types. Intravenous inoculation of virulent material causes lung and pleural lesions, and sometimes pericarditis; in 75% of the cases observed, there were also lesions in the joints. Cases with both lung symptoms and pericarditis developed a fatal septicaemia. Artificial infection *per os* provoked lung lesions in most cases, but no clinical symptoms were manifested. In a few cases there was rapid fatal illness. After subcutaneous or intracutaneous injection, the lymphatic system was affected, with necrosis and suppuration in some instances: experimental infection produced the same changes as occur in natural infection.—E. R. PARISER.

MUNRO, S. S. (1942). **Observations of Mortality During the Course of Poultry Breeding Operations in Canada.**—*J. Amer. vet. med. Ass.* **101.** 256–259. **1174**

An analysis was made of deaths in hens in their first production year, on experimental farms or stations in Canada. One-third of the hatching eggs from each of three farms was retained for rearing and production and the remainder divided between the two remaining farms, in order to test mortality variations due to heredity and environment. Mortality records are given in a table which shows a connexion between death rate and environment and corresponding evidence that heredity did not play the preponderant role, although a minority of deaths were due to egg-transmitted pathogens, *e.g.* leucosis.

In another investigation the progeny of tested cockerels from one breeding centre were distributed to many farms and the mortality records were compared with those of locally reared stock. No significant divergence was noted in a two-year test.

At present it seems that hereditary transmission of disease proneness/susceptibility through male and female lines is of very slight importance. More important is egg transmission of disease agents through the female line alone. Spermatozoa are stated to be thoroughly " filtered " in their passage up the oviduct. [M. appears to imply that " filtered " means " cleared of any infection ". If so, the mechanism of such action is not explained.—ED.]—C. V. WATKINS.

STOVER, D. E. (1942). **Respiratory-Nervous Disorder in Eight-Months Old Pullets.**—*Amer. J. vet. Res.* **3.** 239–241. **1175**

An atypical outbreak is recorded of the respiratory-nervous disorder of chicks previously described [*V. B.* **12.** 537]. About 70% of a flock of 750 birds were affected. Symptoms comprised cyanosis of the comb, anorexia, and general malaise. There were no respiratory or nervous signs. Inoculation of lung and air sac tissues into test birds, however, produced typical respiratory-nervous symptoms in six days. It is suggested that " pullet disease " may be an atypical form of this disorder.—D. D. OGILVIE.

GOSS, L. J. (1942). **Diagnosis and Treatment of Diseases of Wild Animals in Captivity.**—*Cornell Vet.* **32.** 155–161. **1176**

A brief review, by the veterinarian to the N.Y. Zoological Park, Bronx. Among the outbreaks mentioned are :– an attack of infantile paralysis in a gorilla ; TB., an epidemic encephalitis, tetanus and the common cold in other primates ; tetanus (with recovery) in an elephant ; brucellosis in antelopes ; dog distemper and fox encephalitis in wild dogs, wolves and foxes ; infectious feline enteritis in ocelots, margays, fishing cats, jaguarondis, a cheetah and, it is believed, in raccoons ; psittacosis in many avian species, and dirofilariasis.

Kangaroos are especially prone to actinobacillosis and actinomycosis. In this species also, a muscular dystrophy not unlike " stiff lamb " disease has been encountered, and is said to have responded rapidly to treatment with α-tocopherol.—ALASTAIR N. WORDEN.

WEISCHER, F. (1942). Zur Klärung der Kolikfragen. **[Elucidation of the Colic Question].**—*Berl. Münch. tierärztl. Wschr.* Aug. 7th. 235–240. **1177**

This is mainly a general review of recent literature dealing with colic in the horse, with special reference to the importance of dietetic errors. The latter probably account for more than 90% of all colic cases, the remainder being due to such causes as thrombosis and embolism, incarceration, and strangulation. The most important preventive measures are avoidance of unduly long intervals between feeds which result in the food being bolted, gradual introduction of changes in diet, and care in the use of rye or other hard straw even when fed as chaff. So-called " rheumatic colic " does not exist and such factors as " chill ", climatic factors, cold drinking water, or too much or too little water are not considered by W. to be causes of colic.

Drastic forms of treatment should be avoided. Liquid paraffin in doses of 1–5 kg. has been used with success since 1930 and is supplemented by such medicaments as turpentine, sodium sulphate and spiritus aetheris, all given by stomach tube.—E. G. WHITE.

MATTHIAS, D. (1942). Die Bedeutung des Kernvolumens für den Nachweis der recidivierenden Blinddarmkolik des Pferdes. **[The Importance of the Volume of the Nuclei of the Cells of the Muscle Coat for the Verification of Intermittent Caecal Colic in the Horse].**—*Berl. Münch. tierärztl. Wschr.* April 17th. 115–118. **1178**

Anatomical changes in intermittent caecal colic in the horse are characterized by hypertrophy of the muscular coat of the caecum. M. considers that a thickening of the muscle coat alone does not give absolute evidence of the presence of hypertrophy, since the thickness varies individually or may develop in consequence of inflammation, oedema etc. Supported by the findings of LANGE [(1940). *Gegenbaurs. Jb.* p. 363.], he accepts as a criterion for the hypertrophy the enlargement of the nuclei of the cells of the caecal muscle coat. A photomicrograph is shown. His investigations have shown that a normal caecal muscle coat has a thickness up to 1·2 mm. and that the volume of the nuclei is 20–40μ^3.—J. CSONKA.

*BÖCKELMANN, B. (1941). Blutzuckerbestimmung bei Magen-Darm-Krankheiten und Brustseuche des Pferdes. **[Blood Sugar Estimation in Gastro-Intestinal Diseases and in Contagious Pneumonia in Horses].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 230]. **1179**

In observations on 30 colic and two contagious pneumonia cases in horses, it was found that there was a considerable rise in the blood-sugar level in cases of acute colic and that in contagious pneumonia the blood sugar values paralleled the temperature.—J. L. MCGIRR.

NUNGESTER, W. J., KLEPSER, R. G., & KEMPF, A. H. (1942). **Consideration of the Respiratory Pattern as a Predisposing Factor in the Etiology of Pneumonia.**—*J. infect. Dis.* **71.** 57–60. **1180**

The authors studied the effect of the relative force of inspiration and expiration in the experimental production of pneumococcal pneumonia in rats. Some *in vitro* experiments were also carried out with excised lungs and also on recently killed animals to which artificial respiration was administered : in these experiments a viscous mixture of mucin and ink was injected into the trachea and its subsequent distribution was studied both by bronchoscopic examination and by dissection. Pneumonia was produced in live rats by nasal or tracheal administration of type 1 pneumococci in mucin. The incidence of pneumonia produced by this means was much higher in animals in which a forced inspiration was induced by holding the animal's nose for a few seconds. No such effect resulted when a forced expiratory effort was induced and the authors suggest that whereas the forced expiratory effort of coughing may be beneficial by getting rid of mucin, forced inspiration, as in the sobbing type of respiration, may favour accumulation of mucus and predispose to the onset or spread of pneumonic lesions.—E. G. WHITE.

—. (1941). **Remount Breeding and Breeding Disease Data.**—*Vet. Bull. U.S. Army.* **35.** 265–267 **1181**

This article consists entirely of a tabular summary of numerical data on breeding history and diseases of mares at three American army remount depots during the years 1938–39, 1939–40, and 1940–41.—J. E.

FINCHER, M. G., OLAFSON, P., & FERGUSON, J. (1942). **Sterility in Bulls.**—*Cornell Vet.* **32.** 407–423. **1182**

The case histories, together with clinical findings, of six completely sterile bulls are recorded. The gross and the histological changes in the testes of these bulls are described and illustrated; the changes included atrophy, calcification, degeneration of seminiferous tubules, and fibrosis. Hypoplasia of the testicles was present in three of the bulls. Streptococci which produced green discoloration in blood agar plates were recovered from the seminal vesicles and testes of one bull and from the seminal vesicles and ampullae of the vas deferens in another.—N. J. SCORGIE.

*BAREI, D. S. (1941). La lotta contro la sterilità delle bovine in Provincia di Udine. **[Control of Bovine Sterility in Udine Province, Italy].**—*Clin. vet., Milano.* **64.** 85–98 & 131–142. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 27]. **1183**

In this province, farmers have to take their cows to special breeding centres for service. Thus a check is kept on any that are infertile. Such animals are excluded from service and treated.—M. LANDAU.

*CARPANO, M. (1941). La mastite gangrenosa delle pecore e delle capre con particolare riguardo a quella dominante in Albania. **[Gangrenous Mastitis of Sheep and Goats in Albania].**—*Riv. milit. Med. Vet., Roma.* **4.** 5–29 & 73–91. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 279]. **1184**

From cases of ovine and caprine mastitis, C. isolated the following micro-organisms:—Nocard's micrococcus, *Clostridium septicum, Cl. welchii, Fusiformis necrophorus* and "*Spirochaeta necrotropa*". In certain cases mastitis was accompanied by a necrotic pustular dermatitis.—M. LANDAU.

PALAVANDOV, G. (1940). O toksichnosti mozgovoĭ emul'sii pri intravenoznom ee vvedenii. **[Toxicity of Intravenous Injections of Brain Suspensions].**—*Zh. Mikrobiol., Moscow.* No. 8. pp. 73–78. [German summary]. **1185**

Investigations were made on the nature of the shock occasionally observed in human beings, vaccinated against rabies with a phenol vaccine as used by FERMI, when the vaccine had been accidentally administered intravenously. Homologous and heterologous brain suspensions from normal animals, brain suspensions prepared from rabbits which had succumbed after fixed virus inoculation, and suspensions from fresh and dried (4–7 days) spinal cords were inoculated intravenously into rabbits and were found to be highly toxic, the majority of the animals dying from shock. Suspensions preserved by carbolic acid and those prepared several days before inoculation were found to be more toxic than freshly made suspensions. Heating, freezing and filtration through thick paper diminished toxicity. Survival after one shock did not prevent death from shock when a dose was given later. On P.M. examination death was found to be due to multiple arterial and venous thrombosis of the coronary vessels, lungs, liver, kidney and spleen, also in odd cases to haemorrhages in the brain, lungs and liver.

P. believes that the toxic properties of the emulsions are due not to anaphylaxis, emboli, or dissolved substances but to the colloidal structure of the suspension itself. On reaching the bloodstream the suspension breaks the colloidal equilibrium of the body fluid and this gives rise to multiple thrombosis. In P.'s opinion similar conditions occur when human beings receive such a dose of the rabies tissue suspension intravenously, although the phenomenon is not as acute.—A. M.

GRYAZNOV, N. I. (1940). Nespetsificheskoe deĭstvie antirabicheskoĭ vaktsiny. **[Non-Specific Therapeutic Value of Rabies Vaccine].**—*Zh. Mikrobiol., Moscow.* No. 8. pp. 78–79. [English summary]. **1186**

Several patients who had undergone a course of 10–20 prophylactic rabies injections of a phenol vaccine as used by FERMI showed considerable improvement in chronic obstinate conditions such as ischiatic pains, rheumatism and twitching, from which they had suffered before treatment, and presumably before exposure to the rabies infection for which the vaccine was given.—A. MOLDAWSKY.

NUTRITIONAL AND METABOLIC DISORDERS

BRIGGS, H. M., DARLOW, A. E., HAWKINS, L. E., WILLHAM, O. S., & HAUSER, E. R. (1942). **The Influence of Nutrition on the Reproduction of Ewes.**—*Bull. Okla. agric. Exp. Sta.* No. B–255. pp. 30. **1187**

The influence of different nutritional levels on the breeding habits and reproduction of ewes was studied over a period of nine annual breeding seasons. "Flushing" or increasing the food available to ewes just prior to, and during, the breeding season did not result in more lambs or an earlier lamb crop, which are benefits commonly anticipated from this practice. When grain feeding was used to increase the plane of nutrition, it was found that, in all cases except in one group which was fed green cowpeas, the "flushed" ewes had a significantly shorter oestrous cycle than that of the "unflushed" ewes. Fertility of the rams was found to be low during the hot summer weather when the ewes first came in heat, but improved in the cooler autumn weather.—N. J. SCORGIE.

HUPKA, E. (1941). Ueber die Verträglichkeit der Bierhefe als Futter für Schweine. **[Tolerance of Pigs to Brewer's Yeast in their Diet].**—*Dtsch. tierärztl. Wschr.* **49.** 627–628. **1188**

Brewer's yeast is a useful addition to pig rations as a rich source of protein and vitamins. In the dried [killed] form it is more stable and more palatable. As the fresh yeast contains live yeast cells and may cause serious gastric symptoms if given in large amounts, heating the yeast or the food with added yeast before feeding is strongly recommended.—A. M. COPPING.

I. QUACKENBUSH, F. W., KUMMEROW, F. A., & STEENBOCK, H. (1942). **The Effectiveness of Linoleic, Arachidonic, and Linolenic Acids in Reproduction and Lactation.**—*J. Nutrit.* **24.** 213–224. **1189**

II. QUACKENBUSH, F. W., STEENBOCK, H., KUMMEROW, F. A., & PLATZ, B. R. (1942). **Linoleic Acid, Pyridoxine and Pantothenic Acid in Rat Dermatitis.**—*Ibid.* 225–234. **1190**

I. Newly weaned rats were fed on low-fat diets which provided only 3·0 mg. per day of unsaturated fat. After 12 weeks, scaly paws and tails had developed, and females averaged about 150 g. body weight, as compared with nearly 200 g. of controls receiving a stock diet. Oestrus occurred normally, but the deficient females, after mating with normal rats and carrying to term, suffered a marked dystocia, often lasting for 2–3

days, which was accompanied by excessive haemorrhage; all young died within 48 hours of birth. Addition of supplements of cottonseed oil, ethyl arachidonate, or ethyl linolate from the 12th week resulted in remission of skin symptoms and normal reproduction and lactation. Supplements of ethyl linolenate were ineffective.

Scaliness and reproductive failure occurred despite the fact that one of the basal diets contained a rice-bran concentrate. Vitamin B_6 did not alleviate the symptoms in animals which had been maintained on a low-fat diet for 48 weeks. The percentage (of body weight) and iodine number of the body-fat did not differ significantly in rats on deficient and normal dietaries.

II. The skin lesions which resulted when newly weaned rats were fed on a synthetic diet which contained not more than 0·003% of unsaturated fat could be both prevented and cured by ethyl linolate. Vitamin B_6 + pantothenic acid or, to a lesser extent, vitamin B_6 alone, exerted an incomplete prophylactic or curative action. Vitamin B_6 enhanced the beneficial effects of subcurative doses of ethyl linolate.—A. N. Worden.

Booth, R. G., Henry, K. M., & Kon, S. K. (1942). **A Study of the Antirachitic Effect of Fat on Rats receiving High Calcium-Low Phosphorus Rachitogenic Diets.**—*Biochem. J.* **36.** 445–455. **1191**

Vegetable fats devoid of vitamin D, and triglycerides resynthesized from the fatty acids of butter and arachus oil from which the saponifiable residue has been removed, exerted an anti-rachitic effect on rats receiving high Ca, low P rachitogenic diets, as compared with litter-mates in which the fat was isocalorically replaced by starch. The calcifying effect of the resynthesized triglycerides of lard, and of coconut, olive, linseed, and soya bean oils was also demonstrated. Fat exerts no calcifying effect when added to high P, low Ca diets. The addition of fat to the diet lowers the faecal excretion of Ca. It is concluded that the effect of fat is qualitatively different from that of vitamin D.—J. M. R.

I. Gyrögy, P., & Goldblatt, H. (1942). **Observations on the Conditions of Dietary Hepatic Injury (Necrosis, Cirrhosis) in Rats.**—*J. exp. Med.* **75.** 355–368. **1192**

II. Earle, D. P., Jr., & Kendall, F. E. (1942). **Liver Damage and Urinary Excretion of Sulfate in Rats fed *l*-Cystine, *dl*-Methionine, and Cysteic Acid.**—*Ibid.* 191–195. **1193**

III. Earle, D. P., Jr., Smull, K., & Victor, J. (1942). **Effects of Excess Dietary Cysteic Acid, *dl*-Methionine, and Taurine on the Rat Liver.**—*Ibid.* 317–324. **1194**

IV. Miller, L. I., & Whipple, G. H. (1942). **Liver Injury, Liver Protection, and Sulfur Metabolism. Methionine Protects against Chloroform Liver Injury Even When Given after Anesthesia.**—*Ibid.* 421–435. **1195**

I. As the result of experiments on several hundred rats, the aetiology of the hepatic injury hitherto recorded [see *V. B.* **10.** 50.] has been partially elucidated, and it has been shown that the condition results from the same factors as those responsible for fatty infiltration, the fatty changes resulting during short-term experiments and the necrosis and cirrhosis supervening in those of several months' duration. The condition could be produced regularly in rats receiving low casein, high fat diets which were deficient in choline. Cystine supplements aggravated the condition, and choline alone alleviated it to some extent, whereas cystine + choline, or methionine alone prevented its occurrence. In the most severe cases, portal cirrhosis resulted, while renal changes (diffuse necrotizing nephrosis) were of frequent occurrence.

II. The addition of 5 or 10% cystine to the diet of rats resulted usually in a marked urinary sulphate secretion (16–67 mg. of sulphate sulphur per 100 g. body weight per day) and caused either necrosis, cirrhosis, or both, in the liver. When 10 or 13% of methionine was fed, sulphate excretion was equally marked, but liver lesions did not develop during the 12 days of the experimental period. Cysteic acid at a 15% level did not cause a marked sulphate excretion, but induced liver lesions. [Only 15 animals were employed in all. The variations in total sulphur and sulphate sulphur excretion among the three groups were so wide that the conclusions appear somewhat premature.]

III. In short-term experiments (two weeks) with rats, it was found that cysteic acid induced portal necrosis and cirrhosis of the liver when forming 12–15% of the diet, but not when forming only 6%. Atrophy of the hepatic cells, but not any necrotic change, resulted when 6–12% of methionine was fed. Up to 10% of taurine did not induce liver lesions.

IV. In 1912, W. demonstrated that the liver of the foetal or new-born (up to 2–3 weeks) pup exhibited a remarkably high degree of tolerance to chloroform injury, and more recent work showed that the livers of protein-depleted dogs are highly susceptible to such injury, but that this susceptibility may be overcome by administering a single meal of protein or of either methionine or cystine (cystine being less effective). It is now reported that a single intravenous injection of methionine (or of cystine + choline, but not of choline alone) given up to four hours after chloroform anaesthesia will protect against injury.

Analysis of the livers of protein-depleted dogs shows that S deficiency is greater than that of N. Feeding methionine or cystine to such dogs restores the N : S ratio of their livers. The N and S values of foetal or new-born pup livers are within the normal range for adults, but the authors suggest that their tolerance is linked with the presence of blood islands of marrow cells, which disappear by the fourth week of life. The paucity of information relating to the developmental anatomy of the dog's liver is indicated, and it is suggested that a lengthening of the biliary tree must occur as the liver-size expands.

It is suggested that administration of methionine or of a casein digest may prove valuable in protecting the liver against certain types of injury.—A. N. Worden.

Evans, R. J., Robertson, E. I., Rhian, M., & Wilhelm, L. A. (1942). **The Development of Perosis in Turkey Poults and Its Prevention.**—*Poult. Sci.* **21.** 422–429. **1196**

Groups of 15-day-old turkey poults fed on the experimental food mixtures for eight weeks were used to study the factors influencing the development and severity of perosis.

Additions of manganese to a diet containing excess of calcium and phosphorus reduced the incidence of perosis, but Mn did not reduce the incidence of perosis when added to a basal diet containing less Ca and P. Diets of high and low protein content did not greatly influence perosis.

The experiments confirm Jukes' observation [*V. B.* **12.** 114.] that choline prevents severe perosis. Liver meal, 15%, prevented perosis. Herring meal 13% and soya-bean oil-meal 15% gave some protection. Pea meal was without antiperotic effect.—F. D. Asplin.

Nielsen, H. M., & Madsen, D. E. (1942). **Some Studies of Leg Bone Deformities in Turkeys.**—*Poult. Sci.* **21.** 500–504. **1197**

Turkey poults of 6 or 14 weeks of age, made up into groups of 15 each, were fed diets containing normal or low levels of manganese in the presence of normal or high levels of Ca and P. The incidence of bone

deformity at 31 weeks of age was low in all groups. The experiments indicated that a low intake of Mn at eight weeks and over is not a cause of perosis.—F. D. A.

*FRENS, A. M. (1941). **[Copper Deficiency in Cattle].** —*Tijdschr. Diergeneesk.* **68.** 763–768. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 355]. **1198**

Many farmers in the province of Nordholland had experienced difficulty in raising young cattle on pasture. The only clinical symptom was diarrhoea which was not of parasitic origin, and no definite findings were made at autopsy. A discoloration of the hair, especially around the eyes, was observed and in view of GORTER's work on depigmentation in rats (*Ztschr. Vitaminforsch.*, 1935. **4.** 277) the possibility of copper deficiency was suggested. Estimation by a colorimetric method indicated that the copper content of the blood was low. Direct administration of 0·5 g. copper sulphate three times a week to stall-fed cattle had little effect, but manuring of pasture with $CuSO_4$ was effective. Cu deficiency in Holland showed varying symptoms probably due to other complicating factors. Satisfactory diagnosis was not possible without an accurate method of estimating Cu.—A. M. COPPING.

LEWIS, A. H., & WATSON, S. J. (1942). **Teart Pastures.** —*Agriculture, Lond.* **49.** 82–84. **1199**

A popular presentation of the work of the Jealott's Hill Research Station [see FERGUSON *et al.*—*V. B.* **11.** 118.] on the aetiology and control of the "scouring disease", principally of cattle, which occurs on soils derived from the molybdenum-rich upper orgillaceous component of the Lower Lias geological formation, mainly in central Somerset.

Such soils contain 20–100 p.p.m. of molybdenum, and the grasses on them show 3–20 p.p.m. expressed on the fresh herbage. Affected pastures are locally termed "teart". The severity of scouring varies from field to field and is roughly proportional to the content of water-soluble Mo, which is much lower (relatively to total Mo) in old dead herbage and hay than in fresh young herbage. For this reason scouring is worst in periods of flush growth. "Teart" can be experimentally induced by oral dosing, or by top-dressing healthy pastures, with sodium molybdate. Scouring can be prevented by supplying 2 g. copper sulphate per beast per day, best as 1/2 lb. of palatable feeding cubes containing 10 lb. $CuSO_4$ per ton. Cows so provided for can graze the worst teart pastures throughout the season without ill effect. It is useless to apply $CuSO_4$ as fertilizer since plants do not absorb sufficient for the purpose. The amount of Mo in pastures varies with the species of plants and with the pH of the soil. Clovers and Yorkshire fog contain most, and neutral or calcareous soils are more "teart" than acid soils. In the same way, basic fertilizers tend to increase "teartness" in the vegetation and acid fertilizers to decrease it. Old leys with deeper roots tend to be more "teart" than re-seeded pastures. Under war conditions, "teart" pastures should be amongst the first to be ploughed up and a system of alternate husbandry would probably eliminate the problem.—H. H. GREEN.

MUIR, W. R. (1941). **The Teart Pastures of Somerset.** —*Vet. J.* **97.** 387–400. **1200**

A review based chiefly on the data of FERGUSON, LEWIS & WATSON [*V. B.* **11.** 118.], discussing the molybdenosis of cattle occurring in the Lower Lias soils of central Somerset, and similar smaller areas in Gloucestershire and Warwickshire. The essential information in regard to occurrence and control of the disease is included.—H. H. GREEN.

MOURIQUAND, G., ROLLET, J., COISNARD, J., & EDEL, V. (1942). Sur l'avitaminose A du pigeon. **[Vitamin A Deficiency in Pigeons].**—*C. R. Soc. Biol. Paris.* **136.** 606–608. **1201**

Typical symptoms of vitamin A deficiency were observed in pigeons after a very long period on a diet of polished rice supplemented with dried brewer's yeast. The earliest signs were keratinization of the skin of the feet and round the beak after 70–80 days on the deficient diet, while eye lesions appeared after 102–200 days. All the symptoms were cured by administration of carotene.—A. M. COPPING.

I. DAM, H., & GLAVIND, J. (1942). **Factors Influencing Capillary Permeability in the Vitamin E Deficient Chick.**—*Science.* **96.** 235–236. **1202**

II. DAM, H., & KELMAN, E. M. (1942). **The Effect of Vitamin E on the Blood Plasma Lipids of the Chick.** —*Ibid.* 430. **1203**

I. The authors have previously reported that increased capillary permeability was an outstanding feature of vitamin E deficiency in the chick. It is now stated that the intensity of this permeability can be reduced by lowering the concentration of soluble salts in the diet or by feeding either the water-soluble pancreatic extract termed "lipocaic" or inositol. The condition was aggravated by raising the concentration of soluble salts, by increasing the cholesterol content of the diet, or by incorporating traces of histamine.

II. In extension of recent experiments [see I] it is reported that the feeding of either vitamin E or "lipocaic" to vitamin E deficient chicks increases the average ratio of phospholipids to other lipoid fractions in the plasma, whereas feeding cholesterol exerts the reverse effect without at the same time increasing the absolute plasma cholesterol content.—A. N. WORDEN.

HODSON, A. Z., & SMITH, S. E. (1942). **Thiamin Deficiency and Chastek Paralysis in Foxes.**—*Cornell Vet.* **32.** 280–285. **1204**

The findings of GREEN and co-workers were confirmed [see *V. B.* **12.** 507]. Adult silver foxes developed identical symptoms when fed either a vitamin B_1 deficient diet or a diet containing 30% of frozen fish (smelt). In contradistinction to the findings of ENDER & HELGEBOSTAD [see *V. B.* **10.** 698.], a rolling along the long axis of the body was not observed, while anorexia did not commence until after 12–13 days on either diet. [This symptom is not considered to be a feature of main importance from the point of view of diagnosis.]—ALISTAIR N. WORDEN.

LIGHT, R. F., CRACAS, L. J., OLCOTT, C. T., & FREY, C. N. (1942). **Inhibition of the Symbiotic Synthesis of B Complex Factors by Sulfonamides.**—*J. Nutrit.* **24.** 427–435. **1205**

Young rats were maintained on a vitamin B free basal diet together with crystalline supplements of all the identified members of the vitamin B complex other than *p*-aminobenzoic acid. The addition to such a diet of 0·5% of sulphaguanidine resulted in a marked depression of growth which could be overcome by feeding yeast, yeast extract, or the faeces from animals not receiving sulphaguanidine. The faeces from animals receiving sulphaguanidine were less effective, thus providing further evidence that the drug acts by depressing intestinal synthesis of some essential growth factor or factors.

Histological examination of the organs of the rats which had been treated with sulphaguanidine indicated minor changes in some of the arteries. Sulphanilamide and sulphadiazine did not depress growth as did sulphaguanidine, but the animals treated with these two compounds were found to have developed enlarged and hyperaemic thyroid glands.—ALASTAIR N. WORDEN.

CLIMENKO, D. R., & MCCHESNEY, E. W. (1942). **Rôle of Inositol and p-Aminobenzoic Acid in Normal Lactation.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 157–159. **1206**

In experiments involving five groups of 12 albino rats, it was found that when the animals were fed on a diet containing the vitamin B complex but deficient in *p*-aminobenzoic acid and inositol, normal lactation was not sustained and ceased completely about the 14th day and that the mortality rate of the young was high. In the group receiving a supplement of *p*-aminobenzoic acid, the initiation of lactation was delayed until the fifth day but was afterwards normal; the mortality rate of the young was again high. In rats which received inositol, lactation was similar to that of controls on a normal breeding diet but the mortality rate of the young was somewhat higher. The rats receiving both *p*-aminobenzoic acid and inositol were quite comparable in lactation and mortality rates to the controls. [See also SURE—*V. B.* **13.** 138.]—ALFRED T. COWIE.

BOURNE, G. H. (1942). **Vitamin C and Repair of Injured Tissues.**—*Lancet.* **243.** 661–664. **1207**

A review article. B. concludes that vitamin C is necessary for the formation of normal collagen, for wound healing, and for the repair of bone. Possible mechanisms for these effects are discussed, with reference to some of B.'s own work.—D. G. GILMOUR.

CRAVENS, W. W., SEBESTA, E. E., HALPIN, J. G., & HART, E. B. (1942). **Effect of *Lactobacillus casei* ε Eluate Fraction on Reproduction in the Domestic Fowl.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 106–108. **1208**

In experiments involving ten White Leghorn pullets, it was found that a norite eluate of solubilized liver extract, which is required by *Lactinobacillus casei* ε, contained a factor essential for normal embryonic development in the fowl. These pullets were fed on a diet deficient in the above fraction and in about nine weeks the hatchability of the eggs fell to zero; the factor was added and the percentage hatch returned to normal in six weeks. The effect of the factor on egg production was less pronounced but more varied, and is being further investigated. [See also GILLIS *et al.*—*V. B.* **12.** 507.]—ALFRED T. COWIE.

SHAW, J. C., POWELL, R. C., Jr., & KNODT, C. B. (1942). **The Fat Metabolism of the Mammary Gland of the Normal Cow and of the Cow in Ketosis.**—*J. Dairy Sci.* **25.** 909–921. **1209**

In previous experiments it has been shown that large quantities of β-hydroxybutyric acid are utilized by the mammary gland, and it was suggested that some of the short-chain fatty acids peculiar to milk fat may be derived from this source. A further detailed study of four cows with ketosis showed that the short-chain fatty acids of milk fat were below normal, although in these animals the mammary gland used much more β-hydroxybutyric acid, so that it would appear that this acid can no longer be considered as the precursor of these fatty acids.

In two cases of ketosis, 6 lb. of glucose were pumped into the rumen, and within two days there was a marked increase in the water-soluble steam-volatile fatty acids of milk fat and an increase in the unsaturation of the fatty acids. The percentage of short-chain fatty acids was more closely associated with food intake than with the level of blood glucose, lactic acid or acetone bodies; short fasts decreased the short-chain fatty acids to a greater extent than ketosis, although in ketosis the blood glucose is usually much lower than after a few days' fast. It is suggested that the precursors of the short-chain fatty acids may be pre-formed in the liver or the rumen. The low R.Q. of the mammary gland of the fasted cow is probably partly due to the oxidation of β-hydroxybutyric acid. In five experiments the total volume of blood passing through the udder in a period of 24 hours was calculated from the utilization of Ca and P per 100 ml. blood and the total amounts of Ca and P secreted in the milk in a 24-hour period; it was found that each volume of milk required about 500 volumes of blood.—ALFRED T. COWIE.

See also absts. **1306**, **1307** (Co deficiency), **1127-1129** (ascorbic acid), **1323** (vitamins), **1138** (immunity).

PHYSIOLOGY AND ANATOMY

*PRUZSINSKY, B. (1941). **[Ophthalmic Examination of Cattle, Particularly of the Iris].**—*Inaug. Diss., Budapest.* pp. 24. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 244]. **1210**

P. records his observations on the size and shape of the bovine iris and pupil. Comparisons are drawn between findings in calves and those in adults. Special reference is made to the nature and development of pigmentation in the individual layers of the iris.—M. L.

HADWEN, S. (1942). **Reindeer Compared with Domestic Animals in Relation to Fattening, Sex, and Increase.**—*Amer. J. vet. Res.* **3.** 308–311. **1211**

Canadian reindeer maintained under favourable conditions doubled their numbers in three years. At the end of that time the average dressed weight for steers was 167 lb. The great fluctuations in weight during the breeding season are noted.—D. D. OGILVIE.

BEDINGER, P. L., KENDRICK, A. B., & KEETON, R. W. (1942). **Effects of Calcium Administered Parenterally to the Normal and the Parathyroidectomized Dog.**—*J. Pharmacol.* **74.** 1–10. **1212**

Two types of experiment are described. In the first series an 8·4% calcium gluconate solution was injected intravenously and continuously at the rate of 4 ml. per minute into 14 dogs, eight with normal and six with low blood calcium levels (parathyroidectomized), until death supervened. The lethal effect was related neither to the quantity of fluid injected which varied between 250 and 1,000 ml., nor to the initial blood Ca levels which averaged 10 mg. per 100 ml. in the normal and 6·5 mg. per 100 ml. in the parathyroidectomized animals, nor to the blood Ca levels at the time of death which varied between 38 and 240 mg. per 100 ml. The serum proteins fell progressively throughout the course of the injections, the total decrease amounting on the average to 40%. Electrocardiographic tracings showed either cardiac arrest or ventricular fibrillation.

In the second series a single toxic dose of 8·4% calcium gluconate solution (on the average 18 ml. per kg. body weight) was injected intravenously into anaesthetized (nembutal) and unanaesthetized dogs. In order of their occurrence, the following changes were observed in both groups :– loss of serum proteins with plasma volume initially maintained but falling later, accompanied by a polycythemia and terminating with the escape of blood cells from the vascular channels resulting in multiple small haemorrhagic areas in various viscera.

When concentrated solutions of Ca are injected rapidly death may occur as the result of direct effect of Ca on heart muscle, but when toxic doses are injected more slowly, the authors suggest that death results from cardiac anoxia attributable to the viscous, slow-moving polycythaemic blood which is produced as the result of

changes in permeability in and damage to vascular channels.—J. LOCHIEL MCGIRR.

*HRESTAK, M. (1941). **[Development of Bone Marrow in the Bovine Metatarsus].**—*Vet. Arhiv.* **11.** 329–342. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 379]. **1213**

Thirty-five calf foetuses and 19 calves were used in this investigation. Blood formation was observed in foetuses about 82 days old and the formation of white blood corpuscles in those about 100 days old. Blood formation in the bone marrow of the hind metatarsus begins at the 3rd–4th month of gestation and that of fat cells after about 150 days. Blood formation in the metatarsus of cattle ceases after three years of age.
—G. D. S.

FIDLAR, E., & WATERS, E. T. (1941). **The Origin of Platelets. Their Behavior in the Heart-Lung Preparation.**—*J. exp. Med.* **73.** 299–307. **1214**

While considerable evidence is available that blood platelets originate from megakaryocytes, the question of whether the megakaryocytes of the bone marrow or of the lungs are responsible for the greater production is unsettled. In an endeavour to obtain information on this point, the authors employed a technique involving perfusion of the Starling heart-lung preparation with heparinized blood. No satisfactory evidence of platelet production in the lungs was obtained.—J. L. MCGIRR.

HICKS, S. P., & OPIE, E. L. (1942). **Proteolytic Digestion of Red and White Blood Corpuscles in the Spleen.**—*Amer. J. Path.* **18.** 333–341. **1215**

In an attempt to determine whether increased splenic proteolytic activity accompanies the rise in phagocytosis and splenic destruction of blood corpuscles which follows the injection of such cells derived from one animal into the bloodstream of another of the same species, saline-washed rabbit-blood corpuscles were injected intravenously into a series of rabbits. These animals were then killed at varying intervals and, after removal and thorough perfusion of the spleen, a weighed portion of pulped splenic tissue was incubated with pure casein at 37°C., the increase in non-protein-nitrogen following incubation being taken as a measure of proteolytic activity.

The heightened phagocytosis of blood corpuscles which follows the intravenous injection of such cells was found to be paralleled by a rise in splenic proteolytic activity apparently due to the action of an enzyme present in the splenic macrophages.—J. L. MCGIRR.

LENSING, A. (1940). Untersuchungen über Blutreserven bei entmilzten Hühnern. **[Blood Reserves of Splenectomized Fowls].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **49.** 358]. **1216**

Four hens of similar age and breed were splenectomized. It is stated that before the operation an average of 11·96% of erythrocytes and 15·88% of haemoglobin were held in reserve outside the circulation. After splenectomy these figures were 5·58% and 4·98%, and after three weeks the erythrocyte count and haemoglobin content of the circulating blood were lower than they had been before the operation. L. considers that this is a proof that the spleen is not the only reservoir for red blood corpuscles in the hen.
—ANN F. RUSSELL.

DIPALMA, J. R. (1942). **Quantitative Alterations in the Hyperemia Responses to Local Ischemia of the Smallest Blood Vessels of the Human Skin Following Systemic Anoxemia, Hypercapnia, Acidosis, and Alkalosis.**—*J. exp. Med.* **76.** 401–411. **1217**

Using a quantitative method, the response of the smallest blood vessels of the skin to local ischaemia was investigated in human subjects under conditions of systemic anoxaemia, hypercapnia, acidosis, and alkalosis. A decrease in sensitivity to ischaemia and a slowing of the blood flow occurred in anoxaemia and acidosis. The effect of alkalosis was exactly opposite and hypercapnia was found to prevent the changes caused by anoxaemia. In all cases the changes were independent of changes in pulse rate, blood pressure, and respiratory rate and depth. These findings suggest that the carbon dioxide content of the blood, or something directly associated with it, is the most important factor determining the sensitivity of the small vessels. This is in contrast to the generally accepted view that sensitivity is regulated by oxygen saturation or changes in blood pH.—E. G. W.

SIPPEL, W. L. (1942). **Pacinian Corpuscles in Peripheral Nerves.**—*Cornell Vet.* **32.** 314–316. **1218**

S. refers to publications by MITCHELL [*V. B.* **9.** 102.] on nerve lesions in equine degenerative arthritis, in which alleged pathologic alterations in the nerves are described. S. considers these to be normal lamellar or Pacinian corpuscles which occur in peripheral nerves in areas that pass over bones wherever proprioceptors are needed. A photomicrograph of the histology is given.—S. J. GILBERT.

*SZOLNOKI, L. (1941). **[pH of Cow Urine].**—*Inaug. Diss., Budapest.* [Abst. from abst. in *Jber. Vet.-Med.* **69.** 248]. **1219**

Electrometrical measurements were taken of the H-ion concentration of normal cow's urine. The average figures obtained were $8{\cdot}93 \times 10^{-9}$ for naturally voided urine and $1{\cdot}298 \times 10^{-8}$ in the case of urine withdrawn by catheterization. Urine passed naturally loses part of its CO_2 content on contact with air. This explains the difference in pH between samples collected in either of the above ways.—M. LANDAU.

BARKAN, G. (1942). **Ejaculation Induced by a Uterine Drug (Gravitol).**—*Proc. Soc. exp. Biol., N.Y.* **51.** 52–54. **1220**

The di-ethyl-amino-ethyl-ether of 2-methoxy-6-allyl-phenol in the form of its hydrochloride (gravitol, uterol) when injected subcutaneously into male g. pigs induces ejaculation in 10–60 min. In a series of experiments involving 59 g. pigs injected with doses ranging from 10–50 mg. per kg. body weight, it was found that doses of 28 mg. per kg. gave the ejaculatory response in 50% of the cases. The larger doses produced ejaculation which was followed by convulsions. The action of the drug is attributed to the combination of its depressing and stimulating action on the central nervous system. Several homologues of the drug gave positive responses.—ALFRED T. COWIE.

BERLINER, V. R. (1942). **Dilutors for Stallion and Jack Semen.**—*J. Anim. Sci.* **1.** 314–319. **1221**

A satisfactory dilutor for donkey jack and stallion semen is prepared by dissolving a ½ oz. gelatin capsule containing 5·76 g. glucose and 0·67 g. sodium-potassium tartrate (Rochelle salt) in 100 ml. of freshly boiled water and adding one egg-yolk. The dilutor is then sterilized in a water-bath at 60°–70°C. for ½ hour. The dilutor solidifies into a jelly-like consistency at 10°–15°C. and has to be reheated to 25°–30°C. after it has been stored in a refrigerator before liquefaction occurs. Fairly rapid cooling is desirable for diluted semen which is to be stored and a refrigerator temperature of 2°–5°C. is best. Details are given for preparation of the dilutor. For semen which is to be used shortly after collection, the dilutor can be added to the semen in a proportion of 1 : 10. For storage purposes a dilution of 1 : 3 is recommended. Pregnancies were obtained with diluted semen that was stored for 24 and 48 hours.—N. J. S.

CHANG, M. C. (1942). **Effects of Oestrogen (Stilboestrol) on the Sperm Production of Adult Rams.**—*J. Endocrinol.* **3.** 192–202. **1222**

Two three-year-old rams implanted with tablets of diethylstilboestrol, which were left *in situ* for long periods, showed increased sperm production 7–9 days after implantation, the effect lasting for about five days. The implantations had no effect on sex drive, sperm morphology, or quality of spermatozoa. Sperm collected from the stilboestrol-treated rams was capable of fertilization and eight lambs were produced from five artificially inseminated ewes. Spermatozoa from the treated rams showed a high tendency to agglutinate when kept in glucose-phosphate at 37°C.; the cause of this phenomenon was not determined. The absorption rate of the stilboestrol from the implants was 4·25–5 mg. per day. The mode of action is discussed by which stilboestrol induces the temporary increase in sperm production and it is suggested that this effect may be brought about by stimulation of the hypophysis to release accumulated secretions which stimulate spermatogenesis and the accessory sex glands; when these hypophyseal secretions have been dissipated, sperm production falls to approximately its previous level.—N. J. SCORGIE.

*DERIVAUX, J. (1941). Le corps jaune persistant chez la vache. Ses rapports avec le métabolisme phosphocalcique. **[Persistent Corpus Luteum in the Cow. Connexion with Phosphorus-Calcium Metabolism].** —*Ann. Méd. vét.* **85.** 298–311. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 549]. **1223**

Two types of persistent corpus luteum were examined:—(1) cases showing complete absence of oestrus, usually having an atonic uterus and hydrometra; (2) cases showing oestrus but never conceiving, usually without hydrometra but giving a positive reaction for *Brucella abortus*. Determinations of the blood Ca and P gave no indication that the metabolism of these substances was abnormal.—J. G. CARR.

CUMMINGS, J. N. (1942). **A Study of Estrus and Ovulation in the Mare.**—*J. Anim. Sci.* **1.** 309–313. **1224**

Forty oestral periods in 16 mares were studied. Data are given on the length of oestrus and dioestrus and on the time of ovulation. The relative variation between each phenomenon studied was determined by the calculation of the coefficient of variation for each. These coefficients were all quite large, indicating considerable variation in all respects. The observations indicate that what occurred during one oestral period or cycle in each mare had practically no predictive value for the following periods or cycles.—N. J. SCORGIE.

KLEIN, L. A. (1942). **Therapeutic Control of Lactation.** —*Vet. Ext. Quart. Univ. Pa.* No. 88. pp. 3–10. **1225**

A brief review of the more recent advances in the physiology of lactation. Possible therapeutic uses of the sex hormones are suggested. The article contains nothing original.—ALFRED T. COWIE.

WALSH, F. E. (1942). **Dysfunction of the Ovary.**—*J. Amer. vet. med. Ass.* **101.** 404–410. **1226**

A brief review of the physiology and endocrine functions of the ovary. A number of case reports of hormonal treatment in cases of dysfunction of the ovary are given.—ALFRED T. COWIE.

RAY, R. D., EVANS, H. M., & BECKS, H. (1941). **Effect of the Pituitary Growth Hormone on the Epiphyseal Disk of the Tibia of the Rat.**—*Amer. J. Path.* **17.** 509–528. **1227**

In view of apparent contradictions in the literature regarding the response of the skeleton of rats and g. pigs to pituitary growth-hormone injections, the authors initiated an investigation into this question. Forty female rats were divided into three age groups such that they were approximately 54, 88, and 156 days old at autopsy, and each group was subdivided into normal controls, normal injected animals, hypophysectomized controls, and hypophysectomized injected animals. Fourteen days after hypophysectomy, the animals to be treated were given ten daily injections of a standardized pituitary growth-hormone preparation. They were then killed at varying intervals and the right tibia was removed and examined histologically.

In normal rats injections of growth hormone produced a definite increase in endochondral bone formation associated, in rats over 150 days old, with hypertrophy of the epiphyseal cartilage. In hypophysectomized rats, injections of growth hormone resulted in a return to the "youthful" type of epiphyseal line, in increased activity in the diaphysis with the formation of trabeculae and bone deposition, and in stimulation of the myeloid elements of the bone marrow with a concomitant reduction in fat cells. In the hypophysectomized controls diaphyseal trabeculae were absorbed and marrow fat cells increased.—J. LOCHIEL MCGIRR.

SCORGIE, N. J., & OTTAWAY, C. W. (1942). **Two Anatomical Features of Clinical Importance in the Vulvo-Vaginal Tract of the Bovine.**—*Vet. J.* **98.** 134–138. **1228**

A short account is given of the gross anatomy of the vulvo-vaginal tract and its associated structures in the cow, together with some original observations on the ducts of Bartholin's glands and on the canals of Gärtner. A series of annular folds is described in the wall of the anterior vagina, which appear to be a normal feature in the cow but which are not described in standard works on bovine anatomy. Usually 4–6 folds are present, the first being situated at a distance of some 9–11 in. from the labia, with a distance of ½–1 in. between succeeding folds. Examination of dissected specimens showed a thin band of smooth muscle immediately below the mucous coat corresponding to the site of each fold. In the live animal the muscular bands appear to have a marked power of constriction, and in some of the vaginae examined with the aid of a speculum, they narrowed the lumen to such an extent that care was needed to differentiate the constricted fold from the os uteri externum.

A description is also given of an abnormal vertical column of fleshy tissue closely applied to the os uteri which was observed in two maiden heifers. This band appeared to conform to the description given by others for a persistence of the median wall of the Müllerian ducts at the vaginal end of the cervix.—N. J. SCORGIE.

EMMERSON, M. A. (1940). **Studies on the Macroscopic Anatomy of the Bovine Udder and Teat.**—*Vet. Ext. Quart. Univ. Pa.* **41.** No. 80. 3–28. [See also *V. B.* **11.** 725]. **1229**

E. gives a comprehensive review of the bovine udder together with original observations. The lateral suspensory ligaments have an extensive origin from the pre-pubic and sub-pubic tendons, they are non-elastic and form the chief means of support. The elastic median suspensory ligament serves to hold the udder in close proximity to the abdominal wall. The milk-collecting sinus is extensive; it consists of a network of collecting tubules and ducts which open into the multilocular milk sinus (lactiferous sinus) situated at the ventral part of each quarter. Macroscopically this sinus is continuous with the sinus of the teat, although the two are partially separated by a circular fold of mucous membrane.

The arterial supply is from the mammary branch of the external pudic artery. Each mammary artery gives off a branch to the supramammary lymph node and divides into posterior and anterior branches which usually ramify in their respective quarters. The venous drainage is complicated and contains many anastomoses, the chief of which are between the two posterior mammary veins and between the two subcutaneous abdominal veins anterior to the base of the udder. The anastomosis of these veins forms the so-called "venous circle". Blood leaves the udder by three routes:—through the inguinal canal *via* the external pudic veins—the most constant channel; over the ischial arch *via* the perineal vein, and along the anterior abdominal wall *via* the subcutaneous abdominal veins. These latter veins pierce the abdominal wall, forming the so-called "milk wells," to join the internal thoracic veins.

The external pudic vessels form an S-shaped curve ventral to the inguinal canal. This curve is not present in the young heifer, and is very likely the result of lengthening of the vessels to supply the gland following the stimulus of the first pregnancy.—C. W. OTTAWAY.

WEBER, W. (1942). Anatomie für die Praxis. 3. Anatomisch-klinische Untersuchungen über die Punktions- und Anästhesiestellen des Rückenmarkes und über die Lage des Gehirnes beim Rind. **[Anatomy in Practice. 3. Anatomical-Clinical Experiments on Puncture and Anaesthesia of the Spinal Cord and on the Position of the Brain in the Ox].**—*Schweiz. Arch. Tierheilk.* **84.** 161–173. **1230**

In atlanto-occipital puncture the needle is introduced into a diverticulum of the subarachnoid space. A puncture at this site is liable to enter the spinal cord, the spinal blood vessels, or even the joint capsule. In lumbo-sacral puncture the needle is inserted into the narrow subdural space at the level of the termination of the spinal cord proper.

In W.'s opinion, the rapid anaesthesia obtained with sacro-coccygeal injection is due to the forward slope of the sacrum which allows the anaesthetic quickly to envelop the nerves in this region. It was found exceedingly difficult to expose the brain surface of the ox by dissection owing to the unwieldy nature of the surrounding tissues.—C. W. OTTAWAY.

*ZIMMERMANN, G. (1940). **[Topographical Anatomy of the Peritoneal Cavity of the Sheep].**—*Állatorv. Közl.* **36.** 53–61. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 68]. **1231**

Anatomical details are given of the omentum and omental cavity of the sheep.—M. LANDAU.

*IWANOFF, S. (1940). **[Position of Pleural Pouches in the Sheep and Pig].**—*Yearb. vet. med. Fac., Sofia.* **16.** 177–188. [In Bulgarian]. [Abst. from abst. in *Jber. Vet.-Med.* **68.** 146]. **1232**

An examination of 539 nearly full-term sheep embryos showed that in the majority of cases the apex of the pleural sac (cupola pleurae) extended beyond the level of the first rib. This was more common on the right side than on the left. In none of the 200 pig embryos examined was such an extension noted.

—C. W. OTTAWAY.

See also absts. **1322** (haematology), **1286** (haemoglobinometry), **1323** (vitamins).

POISONS AND POISONING

RINDFLEISCH-SEYFARTH, M. (1942). Die Nierengicht des Geflügels—ein Kochsalzschaden? **[Renal Gout in Poultry—Sodium Chloride Injury?]**—*Dtsch. tierärztl. Wschr.* **50.** 366–367. **1233**

A not very convincing account of clinical cases in an attempt to show that small quantities of common salt give rise to renal gout in poultry. A mash containing 3% fish meal was replaced by a wet mash of middlings and milk, after which mortality due to renal gout amongst chickens stopped. No analysis of the mash is given.—TJ. BAKKER.

VUILLAUME, R., & GILLET, J. (1942). Teneur en acide cyanhydrique de quelques tourteaux de lin. **[The Hydrocyanic Acid Content of Different Samples of Linseed Cake].**—*C. R. Soc. Biol. Paris.* **136.** 614–616. **1234**

Estimation of the HCN content of 19 samples of linseed cake from various sources gave values ranging from 243–607 mg. per kg. for freshly manufactured cakes and from 54–486 mg. for cakes stored for three years. Tests for rate of hydrolysis of cyanide in the cakes indicated no relation between the actual content of HCN and its rate of liberation. There was more rapid liberation when the cakes were broken up finely. It is considered that the rate of liberation of HCN was the most important factor in determining the toxicity of linseed cake as a cattle food.—A. M. COPPING.

HORNBY, H. E., & FRENCH, M. H. (1942). **Acute Nicotine Poisoning of Cattle.**—*J. S. Afr. vet. med. Ass.* **13.** 21–25. **1235**

In the search for a satisfactory tsetse fly repellent, nicotine sulphate was one of the substances tried. It was sprayed over the bodies of cattle in weak solution. In one case, 2 litres of a 1·2% aqueous solution were sprayed on the animal. Symptoms of poisoning developed in half an hour and death occurred an hour later. Rapid respiration and rapid weak pulse with muscular tremors and salivation occurred, ending in coma. A second animal dealt with in exactly the same way and tied up so that licking could not occur, died with the same symptoms in an even shorter time. Cyanosis, engorgement of the subcutaneous blood-vessels, and poor coagulation of the blood were observed P.M. In a third case 0·8% was used in a 3% wattle bark extract to delay absorption. Symptoms commenced after an hour. Respirations became rapid and the pulse almost imperceptible. After about six hours recovery took place. Further experiments showed that absorption apparently occurred through the unbroken skin. The article gives fresh evidence of the extreme toxicity of nicotine compounds.—E. M. ROBINSON.

STEYN, D. G., & VAN DER WALT, S. J. (1942). **Chinkerinchee or Star of Bethlehem Poisoning of Stock.**—*Fmg S. Afr.* **17.** 133–136. **1236**

There are various species of *Ornithogalum* known as "chinkerinchee" or "star of Bethlehem" and belonging to the lily family. All have proved poisonous to stock. Horses will rarely eat them unless they are present in hay, but cattle and sheep may eat them on the veld. All the species show a preference for wet marshy places. Their toxic principles are unknown. The symptoms of poisoning are colic, thirst, weak and rapid pulse, severe watery, and sometimes bloody, diarrhoea, and marked general weakness. Sudden death may occur before symptoms are observed and blindness has been reported in some outbreaks. In tests, actual injury to the internal parts of the eye occurred resulting in many instances in permanent blindness. In such cases the pupil was small and oblong but no other changes could be noted externally.—E. M. ROBINSON.

See also absts. **1212** (Ca parenterally **1144** (toxin in tick eggs).

THERAPEUTICS AND DISINFECTION

—. (1942). **Approved Names for Drugs.**—*Lancet.* **243.** 561. **1237**

A number of principles as guide in the selection of names for new drugs has been adopted by the Pharmacopoeia Commission, which has also formed an advisory committee in nomenclature to assist in the selection of new names. The commission hopes that the approved names will be generally adopted and will especially deprecate the introduction of new names for substances for which approved names have been published.

—J. M. ROBSON.

KERMACK, W. O. (1942). **Some Recent Advances in Chemotherapy.**—*Edinb. med. J.* **49.** 429–457. **1238**

A very good review of recent work on (1) antimalarials, (2) antitrypanosome drugs, and (3) sulphonamides. The work on the natural product, quinine, and on the two synthetic antimalarials, mepacrine (atebrin) and pamaquin (plasmoquine) is discussed. It is pointed out that the sulphonamides and undecanediamidine also possess some antimalarial activity. The trypanocidals, like the antimalarials, also belong to a small number of types of compounds, and here, too, the activity is often markedly influenced by small changes of constitution. Bayer 205 [germanin or antrypol] has been known as a potent trypanocide for a number of years, but recent work has shown that diamidine derivatives may also be valuable against trypanosomes and in the treatment of human kala-azar. Recent work suggests that three diamidines, *viz*, *p-p'*-diamidinodiphenoxypentane, *p-p'*-diamidinodiphenoxypropane, and diamidinostilbene may also be potent antibacterial substances.

The most important sulphonamides are described and the recent work on their mode of action is then reviewed in some detail, with special reference to (1) the part played by substrate competition with *p*-aminobenzoic acid, an essential metabolite of the bacteria, and (2) the importance of the natural defences of the body. It is pointed out that the theory of substrate competition may be of value in the discovery of new antibacterial substances, based on the formulae of other essential metabolites. Reference is lastly made to the recent work on penicillin and other bacterial metabolic products.—J. M. ROBSON.

MARTIN, G. J., FISHER, C. V., & THOMPSON, M. R. (1942). **Therapeutic and Prophylactic Detoxication of Sulfanilamide, Sulfapyridine and Sulfathiazole.**—*Arch. intern. Med.* **69.** 662–669. **1239**

The acute toxicities of sulphanilamide, sulphathiazole, and sulphapyridine in mice were appreciably reduced by the administration of various detoxifying substances, such as cystine, aminoacetic acid, calcium glucuronate, and ascorbic acid. The chemotherapeutic activity of the sulphonamides when administered with detoxifying substances was maintained or enhanced. The rate of absorption was increased when a sulphonamide was administered with detoxifying substances.

—J. M. ROBSON.

I. FOSTER, J. W. (1942). **Quantitative Estimation of Penicillin. [Correspondence].**—*J. biol. Chem.* **144.** 285–286. **1240**

II. CATCH, J. R., COOK, A. H., & HEILBRON, I. M. (1942). **Purification and Chemistry of Penicillin. [Correspondence].**—*Nature, Lond.* **150.** 633–634. **1241**

III. CHALLINOR, S. W. (1942). **Production of Penicillin. [Correspondence].**—*Ibid.* 688. **1242**

I. A simple, rapid, and relatively sensitive method of assay is described for penicillin, based on the fact that graded doses of penicillin produce quantitatively a proportional inhibition of growth of *Staphylococcus aureus* in nutrient broth. Growth is measured turbidimetrically as a function of penicillin concentration.

II. Attempts to purify penicillin by the procedure described by ABRAHAM *et al.* [*V. B.* **12.** 610.] were unsuccessful and a new chromatographic technique is described. The method involves a chemical reaction which for the first time provides a rapid means of concentrating penicillin to a high degree with the minimum risk of chemical change. Penicillin obtained by this method in the form of its strontium salt gave analytical figures in agreement with the formula $C_{24}H_{34}O_{11}NSr$. Some of its chemical properties are discussed.

III. A modified method of production of penicillin is described. Addition of small quantities of the culture fluid from an 11-day culture of a previous batch of *Penicillium notatum* to a medium adequately buffered with a strong solution of mixed phosphate buffers resulted in the production in 5–6 days of an amount of antibacterial substance at least equal to that produced in 10–11 days by the method described by FLOREY *et al.* [*V. B.* **12.** R1–R6]. Further preliminary experiments suggest that adequate buffering of the medium without addition of the culture fluid may give a similar rapid production of penicillin.—R. ALLCROFT.

KOCHOLATY, W. (1942). **Microbial Antagonism and Brucella abortus.**—*J. Bact.* **44.** 143. [Only abst. given]. **1242a**

In a preliminary report, K. states that of a number of antibacterial preparations tested three appeared to be highly bacteriostatic and bactericidal *in vitro* against *Br. abortus*. They were :– pyocyanase [see *V. B.* **12.** R1.] streptothricin [*V. B.* **12.** 510.], and "penatin" a new substance produced by *Penicillium notatum* but not identical to penicillin. While penicillin has only very weak antibacterial activity against *Br. abortus* and practically none against *Bacterium coli*, penatin is highly bacteriostatic and bactericidal against both these organisms and even more so against Gram-positive micro-organisms such as *Staphylococcus aureus*.—R. A.

COULTHARD, C. E., SHORT, W. F., MICHAELIS, R., SYKES, G., SKRIMSHIRE, G. E. H., STANDFAST, A. F. B., BIRKINSHAW, J. H., & RAISTRICK, H. (1942). **Notatin: an Antibacterial Glucose-aerodehydrogenase from *Penicillium notatum* Westling. [Correspondence].**—*Nature, Lond.* **150.** 634–635. **1242b**

When a selected strain of *P. notatum* is grown on a Czapek-Dox medium an antibacterial substance is produced which differs in most of its properties from penicillin. This substance was originally named "penicillin A" but in order to avoid confusion with penicillin the name "notatin" is preferred. The method of preparation and properties of the substance are described. Notatin exerts its antibacterial activity only under certain well defined conditions, *viz*, (1) presence of oxygen, (2) presence of glucose, and (3) absence of appreciable amounts of catalase. Under these conditions it is a very powerful bactericide and the growth of *Streptococcus aureus* has been inhibited in dilutions of 1 part in 1,000,000,000. It is also active in high dilutions against other Gram-positive and Gram-negative organisms including *Streptococcus haemolyticus*, *Str. pneumoniae*, *Salmonella typhi*, *S. paratyphi* A and B, *S. typhi-murium*, *Vibrio cholerae*, *Bacillus anthracis*, and *Proteus vulgaris*. The whole behaviour of notatin suggests that it is an enzyme similar to, but much more potent than, the glucose oxidase obtained from *Aspergillus niger* mycelium which is considered to be a glucose aerodehydrogenase. *In vivo* experiments indicate a therapeutic effect with very small doses of notatin.

The chemical and bacteriological results given by KOCHOLATY [see preceding abst.] are insufficient to show whether penatin is identical with notatin.—R. A.

BRYAN, C. S., & RUHLAND, H. H. (1942). **The Udder Infusion Treatments in a Herd Program for the Control of Streptococcic Mastitis.**—*Quart. Bull. Mich. agric. Exp. Sta.* **24.** 290–291. **1243**

An explanation for farmers of the measures necessary for mastitis control.—D. L. HUGHES.

HOVMAND, H. C. (1942). **Effect of modern Sulfonamides on Horse-pathogenic β-hemolytic Streptococci. Experimental Studies.**—*Skand. VetTidskr.* **32.** 669–706. [In English]. **1244**

Tests *in vitro* and experiments on mice with several strains of haemolytic streptococci pathogenic to the horse and isolated from cases of strangles, septicaemia, petechial fever, and other lesions have shown that these strains are sensitive to sulphonamides. Sulphathiazole had the strongest bacteriostatic action, but proved to be the most toxic, especially when the resulting concentration of the drug in the blood was taken into consideration. The bacteriostatic activity of sulphanilamide was considerably less than that of sulphathiazole and about the same as that of sulphapyridine. Nevertheless, the administration of sulphanilamide can reasonably be expected to produce some favourable effect in practice against streptococcal infections of the horse. The use of sulphonamides in veterinary practice is discussed and a rational scheme suggested.—J. M. ROBSON.

SCHMIDT, L. H., SESLER, C., & DETTWILER, H. A. (1942). **Studies on Sulfonamide-Resistant Organisms. I. Development of Sulfapyridine Resistance by Pneumococci.**—*J. Pharmacol.* **74.** 175–189. **1245**

Three passages through mice treated with less than curative doses of sulphapyridine caused high resistance to this drug to develop in 2 strains of type III pneumococcus. A strain of type I pneumococcus originally more highly sensitive to the drug developed a similar resistance more slowly. The resistance of these strains was also demonstrable *in vitro*.

A sulphapyridine-sensitive strain of type II pneumococcus became highly resistant to the drug after serial passage through broth containing increasing quantities (up to 160 mg. %) of sulphapyridine. The *in vitro* resistant organism was also resistant *in vivo*. The increase in resistance both *in vivo* and *in vitro* is a gradual process and when well established was found to be maintained for more than 200 passages through untreated mice.

The manner in which resistant strains are developed and possible explanations for sulphonamide resistance are discussed.—E. J. M. HAYWARD.

*ŠEBETIĆ, Č. (1941). **[Value of Prontosil in Anthrax].** —*Vet. Arhiv.* **11.** 321–328. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 379]. **1246**

Prontosil, whether administered intramuscularly or intravenously, was not found effective in reducing the lethal effect of cultures of *Bacillus anthracis* injected into rabbits.—G. D. S.

*OKLJEŠA, B., & ZAPLATIĆ, R. (1941). **[Resistance of Cattle Trichomonads to some Uterine Antiseptics].** —*Vet. Arhiv.* **11.** 549–558. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 381]. **1247**

This is a summary of the lethal effects on trichomonads of various, presumably proprietary, preparations. Trypaflavine and chinosol are successfully used in practice but, as they have no rapid lethal action, it is presumed that the results of the treatment are due to other causes.—G. D. S.

HORTON-SMITH, C., & TAYLOR, E. L. (1942) **Sulphamethazine and Sulphadiazine Treatment in Caecal Coccidiosis of Chickens. A Preliminary Note.**—*Vet. Rec.* **54.** 516. **1248**

When daily doses of sulphamethazine or sulphadiazine were administered to chicks 72–96 hours after they had received lethal doses of oocysts of *Eimeria tenella*, development of coccidiosis was almost completely prevented. It appears, therefore, that both drugs have a definite coccidiocidal action, and are consequently a great advance over other drugs which have been tried in such infections, *e.g.* sulphaguanidine [see HORTON SMITH—*V. B.* **12.** 554.] has not been shown to have more than a coccidiostatic action and it must be administered concurrently with the oocysts to have any apparent effect.—D. G. DAVEY.

BISHOP, A. (1942). **Chemotherapy and Avian Malaria.** —*Parasitology.* **34.** 1–54. **1249**

This paper, which covers a wide field, gives an admirable review of the subject. Some of the topics considered are the effects of plasmoquine, atebrin, and their related compounds, chemical constitution and antimalarial activity, and drug resistance in bird malaria. Drugs differ in their action upon malaria of man, monkeys, and birds, *e.g.*, sulphanilamide compounds have a definite action upon some species of monkey plasmodia, but they are ineffective in the treatment of *P. cathemerium* infection in canaries and *P. lophurae* infection in young chickens. Some workers consider that the effect of sulphanilamide compounds upon human malaria is small. Some drugs are more effective upon malaria of man than upon avian malaria, but the study of avian malaria is held to be of considerable value in estimating the antimalarial activity of new compounds.—C. HORTON SMITH.

COHEN, A., & KING, H. (1938). **Antiplasmodial Action and Chemical Constitution. Part I. Cinchona Alkaloidal Derivatives and Allied Substances.**—*Proc. roy. Soc.* Ser. B. **125.** 49–60. **1250**

AINLEY, A. D., & KING, H. (1938). **Antiplasmodial Action and Chemical Constitution. Part II. Some Simple Synthetic Analogues of Quinine and Cinchonine.**—*Ibid.* 60–92. **1251**

KING, H., & WORK, T. S. (1940). **Antiplasmodial Action and Chemical Constitution. Part III. Carbinolamines derived from Naphthalene and Quinoline.** —*J. chem. Soc.* pp. 1307–1315. **1252**

WORK, T. S. (1940). **Antiplasmodial Action and Chemical Constitution. Part IV. The Synthesis of some Complex Carbinolamines and Polyamines.**—*Ibid.* pp. 1315–1320. **1253**

KING, H., & WORK, T. S. (1942). **Antiplasmodial Action and Chemical Constitution. Part V. Carbinolamines derived from 6-Methoxyquinoline.**—*Ibid.* pp. 401–404. **1254**

WORK, T. S. (1942). **Antiplasmodial Action and Chemical Constitution. Part VI. Compounds related to Lepidylamine.**—*Ibid.* pp. 426–429. **1255**

I. Canaries infected experimentally with *Plasmodium relictum* were used to study the effects on the therapeutic activity of changes of structure in the cinchona alkaloids. It was shown that antiplasmodial action is not very sensitive to stereochemical changes but is sensitive to changes in structure. The best illustration of this is the apparent loss of activity when the central –CHOH– group is modified in any way, *e.g.* its alteration by conversion into –CHCl–, $–CH_2–$ or –CH= leads in almost all cases to an increase in toxicity and loss of antiplasmodial action. If the –CHOH– group is kept intact, activity may be retained with some change of structure. The preparation and properties of a series of allied substances is described.

II. Quinicine (quinotoxine), the ketonic isomeride of quinine, was found to be inactive against bird malaria. Reduction to dihydroquinicinol (2 diastereoisomerides) with reformation of a carbinol group did not restore activity, nor was α-N-methyldihydroquinicinol active. 4-quinolyl-α-piperidylcarbinol, 4-(6-methoxyquinolyl)-α-piperidylcarbinol, and their *N*-alkyl derivatives were synthesized and their antiplasmodial activity investigated in canaries. The only compounds showing antiplasmodial activity were 4-(6-methoxyquinolyl)-α-piperidylcarbinol and its diastereoisomeride *iso*-4-(6-methoxyquinolyl)-α-piperidylcarbinol. These two substances appear to be the first simple substances built on the pattern of the cinchona alkaloid molecule to show antiplasmodial activity.

III. In an attempt to prepare simpler antiplasmodial substances based on the formula of quinine than those described in II, a series of 1 : 2-carbinolamines was prepared from naphthalene and quinoline and from their methoxy-derivatives. Antiplasmodial activity was found in the dibutyl-, diamyl-, and dihexyl-aminomethyl-6-methoxy-4-quinolylcarbinols, but the lower and higher homologues were inactive. These are amongst the simplest substances to show antiplasmodial activity.

IV. A wide variety of carbinolamines and polyamines were prepared in an attempt to assess the importance of the "quinoline half" of the molecule. None of the prepared compounds showed any antiplasmodial activity against *P. relictum* in canaries and it is therefore concluded that the quinoline nucleus of the cinchona alkaloids and of synthetic antimalarials is a patent factor in the production of antiplasmodial activity. The results of FULTON [*V. B.* **11.** 18.] on the antiplasmodial activity of such a simple base as 1-diethylamino-4-aminopentane are contrary to this conclusion.

V. The preparation of a number of unsymmetrical dialkylamines is described and from these 1 : 2-carbinolamines were synthesized, containing the 6-methoxyquinoline nucleus. Although the structure of these carbinolamines was very close to that of active antiplasmodials described in III, these bases were inactive against *P. relictum* in canaries.

VI. Polyamines were synthesized containing the diethylamino*iso*amyl side chain of plasmochin attached to the lepidylamine nucleus and to 6-chloro- and 6-methoxy-lepidylamine; sulphanilyl derivatives of these lepidylamines were also prepared. None of the polyamines containing the quinoline nucleus and none of the sulphonamides showed any activity against *P. relictum* in canaries.—R. ALLCROFT.

ROSENBUSCH, F. (1938). La acaprina en el tratamiento de la tristeza. **[Treatment of Bovine Piroplasmosis and Anaplasmosis with Acaprin].**—*J. agron. vet., Univ. B. Aires, 1937.* pp. 19–25. **1256**

R. has found acaprin to be specific in *Babesia bigemina* infection, the blood being uninfective eight days after treatment. In *B. argentina* infection, acaprin is also specific although it is not quite as quickly effective as in *B. bigemina* infection. Acaprin was ineffective for anaplasmosis.—MILLER WATSON.

BRACCI TORSI, C. (1942). Trattamento con sulfamidici nella laringo-tracheite epidemica dei polli. **[Sulphonamide Therapy of Avian Laryngotracheitis].**—*Nuova Vet.* **20.** 93–94. **1257**

The author treated a small number of affected hens with sulphapyridine, giving each bird a single dose of 0·5 g. For a short period after administration of the drug the birds appeared very lethargic and sleepy, but gradually became brighter and sought water. By the 4th–5th day they were much stronger and were then given 0·25 g. doses of sulphapyridine daily for several days. The birds recovered. Smaller doses of sulphapyridine, even when given daily, were ineffective.

—MILLER WATSON.

DU TOIT, R., GRAF, H., & BEKKER, P. M. (1941). **Resistance to Arsenic as Displayed by the Single Host Blue Tick *Boophilus decoloratus* (Koch) in a Localised Area of the Union of South Africa: Preliminary Report.**—*J. S. Afr. vet. med. Ass.* **12.** 50–58. **1258**

The observation was made that in the East London district of the Cape Province, *B. decoloratus* shows a high resistance to, or tolerance of, sodium arsenite solutions at the usual strengths used for dipping. The other tick species present in the area, *Rhipicephalus evertsi, R. appendiculatus, R. simus, R. capensis,* and *Amblyomma hebraeum* did not display this resistance. The addition of well emulsified paraffin-resin-casein soap emulsion did not greatly improve the dip. Copper sulphate caused some improvement as did the addition of a well emulsified carbolic dip. An effective control was found in the addition of 40% nicotine sulphate in the proportion of 1 : 1,000 of the dip, giving a 0·04% nicotine solution. A small proportion of ticks escapes and 3–4 dippings are necessary to clean the cattle completely. The effectiveness of the nicotine sulphate solution left in the dipping tanks is maintained for long periods.

—E. M. ROBINSON.

BEKKER, P. M. (1942). **Use of Waste Tobacco in Dips.** *Fmg S. Afr.* **17.** 695–698 & 714. **1259**

Without any change in the external appearance of *Boophilus decoloratus* or in its life-cycle or its habits, there has developed in a relatively limited portion of the eastern Cape Province, as reported in the preceding abstract, a strain which cannot be controlled by means of arsenical dips. The only efficient method of control is regular dipping of cattle at intervals of seven days in an arsenical dip (0·16% As_2O_3) to which nicotine at a concentration of 0·04% has been added. Even then there are cases where the animals are altogether free from the resistant strain of blue tick only after the seventh dipping. Since 40% nicotine sulphate is scarce and costly in Africa, a method was evolved of leaching nicotine from waste tobacco. Nicotine is stable in the presence of arsenic in the dipping tank, but is attacked and destroyed by bacteria if no arsenic is present.

[The above findings suggest that if nicotine could be obtained sufficiently cheaply in Great Britain, it might be incorporated in arsenical dips, or in washes and dusts, against the sheep tick, *Ixodes ricinus*.]

—A. MILNE.

ROBINSON, G. G. (1942). **The Relative Toxicity of Rotenone and Pyrethrum in Oil to the Argasid Tick, *Ornithodorus moubata*, Murray.**—*Bull. ent. Res.* **33.** 273–281. **1260**

Contact insecticides are of use for controlling *O. moubata*. Coal-tar phenols, *e.g.* xylenol, were found to be useful intermediate solvents for making solutions of rotenone in both mineral and vegetable oils. The solutions used were (1) 1·5% rotenone in xylenol, ground-nut oil and Shell oil P 31, (2) 1·5% rotenone in xylenol and ground-nut oil, (3) 0·15% pyrethrin I in Shell oil P 31. Medium petroleum oil was better than ground-nut oil as a carrier of rotenone in xylenol. The rotenone solutions proved far less toxic than an equal weight of the solution of pyrethrin I in medium petroleum oil. A useful summary is given of past work on the keeping qualities of rotenone. Neither of the two rotenone solutions used in the present experiments showed deterioration in its toxicity for *O. moubata* when re-tested after storage for six weeks in the dark at room temperature.

R. concludes that the intensity of toxic effect of a poison varies directly with the rate of entry and inversely with the rate of excretion of the poison ; the superiority of petroleum oil over vegetable oil as a vehicle for rotenone, may be attributed to its greater speed of entry through the cuticle of the tick ; the fact that pyrethrin I used at one-tenth the concentration of rotenone is a considerably more powerful poison than the latter shows that, even in peace-time conditions, pyrethrum is much more economical to use against this tick. [The pyrethrum spray might be tried out in kennels in Great Britain against the dog tick, *Ixodes canisuga*.]

—A. MILNE.

MAIL, G. A. (1942). **Tick Control with Special Reference to** *Dermacentor andersoni* **Stiles.**—*Sci. Agric.* **23.** 59–67. **1261**

M. draws attention to the inadequacy of present control measures for ticks, which every year cause outbreaks of paralysis among man and animals in south and central British Columbia. Elimination of reservoir hosts, or control of ticks by means of their natural enemies, seem unlikely.

Oral administration of various substances to host animals has so far failed to prevent ticks from attacking. Dipping is preferable to spraying, dusting, or local applications as a method of applying acaricides to cattle and sheep. Most livestock sprays have an oil base, but oil-water emulsions are equally effective and cause less physiological disturbance to the animal. Arsenicals are still considered to be the best anti-tick dips, but M. thinks that organic compounds such as dinitro-cyclohexyl-phenol, 3,5-dinitro-*o*-cresol, and related compounds merit further investigation, although they are highly toxic to domestic animals in all but very high dilutions. Derris and pyrethrum appear to be ideal, but they are expensive and do not have a great lasting effect. Spraying of tick-infested vegetation with nicotine sulphate has given good results, but its practical application is limited. Long fleece, with a heavy coating of grease near the skin, appears to kill a few ticks, probably by physical entanglement and suffocation, since lanolin has neither repellent nor toxic properties.

In British Columbia, *D. andersoni* attacks and feeds readily during the spring months, but later, although it may still attack, it is seldom able to engorge, the reason for this being unknown. Evidence is quoted to show that host animals can acquire immunity to attacks by ticks.—G. B. S. HEATH.

—. (1942). **Mange in Horses, Cattle and Sheep.**—*Fmrs' Bull. Dep. Agric. Can.* No. 109. pp. 14. **1262**

A good summary is given of the causes, symptoms, lesions, and treatment of mange or scab of domestic stock in Canada. The sarcoptic, psoroptic, and symbiotic forms in horses, mules, asses, cattle, and sheep are dealt with, and also the demodectic form in cattle. The sarcoptic form is most difficult to cure, but is less common in cattle than in horses. Psoroptic forms cause serious losses chiefly in cattle and sheep. The demodectic form is not often recognized as such ; the mites are found only in the hair follicles deep down in the skin. This form is practically incurable, although its progress may be delayed by regular dipping in a suitable mixture. Limited outbreaks of mange in horses and cattle may be treated by hand application of the following dressing which is not suitable for sheep : sulphur, 2 lb. ; oil of tar, 8 oz. ; raw linseed oil, 1 gal. These ingredients should be gradually heated together, but not boiled, as the sulphur and tar will cake on the bottom of the vessel if heated too rapidly or if brought to the boiling point. The mixture should be applied under the supervision of a veterinary inspector. Animals should first be clipped, all crusts and scabs removed by washing with hot water and castile soap, and the mixture applied as soon as the animal's coat is dry. The dressing should be applied over the whole surface of the body and extremities of the animal, including the ears and tail, at a temperature of not less than 110°F. and not more than 120°F. Two dressings only are necessary except in severe cases. Forty-eight hours before the second application (12th–14th day inclusive) the first dressing should be washed off with hot water and castile soap. Ten days after the second application the animal should again be washed to remove the dressing. Upon completion of the first treatment, all refuse should be promptly burned and all places and materials with which the animals have been in contact should be thoroughly disinfected. In major outbreaks, lime-sulphur dip has given satisfactory results. The dipping bath should be maintained at not less than 110°F. nor more than 115°F. The animals are held in the bath for at least 2 min., during which period all crusts and scabs should be loosened with a stiff brush. Clipping before treatment is essential in the case of sheep. Animals should be dipped twice with an interval of 12–14 days. Under proper treatment and strict sanitation the disease is curable, but if neglected it may necessitate the slaughter of badly diseased animals. Regulations pertaining to mange and scab are given in detail. Apparently any form is notifiable [probably because farmers can not distinguish between the different forms]. In certain circumstances, the veterinary officer can order the slaughter of animals, with compensation to the owner, but special authority is required from the Minister of Agriculture.—A. MILNE.

MCNELLIS, R. (1942). **Fuadin in the Treatment of Verminous Dermatitis in Horses.**—*Army vet. Bull., Wash.* **36.** 93–95. **1268**

Verminous dermatitis is a disease which occurs in the Philippine Islands and is caused by microfilariae of undetermined origin. Treatment for it is unsatisfactory, and the author now adds fouadin to the list of drugs which have been tried unsuccessfully. He used it intramuscularly in two cases and concluded that it had little or no therapeutic value in this disease. In case the drug may be used for other purposes in horses, he records his experience with dosage, and advises that not more than 100 ml. of the preparation should be given intramuscularly in any one day, and that the whole course of treatment should not include the administration of more than 1,200 ml.—D. G. DAVEY.

STUBBS, E. L. (1942). **The Use of Sodium Sulfanilly Sulfanilate in Transmissible Leukosis of Chickens.**—*Vet. Ext. Quart. Univ. Pa.* No. 88. pp. 11–14. **1264**

Seventeen chickens artificially infected with transmissible leucosis were treated with sodium sulphanilyl sulphanilate ; 16 were left untreated as controls. Twelve of the control chickens and 15 treated chickens died after showing blood changes typical of leucaemia. Under the conditions of the experiment sodium sulphanilyl sulphanilate had no beneficial effect.

—F. D. ASPLIN.

KERNKAMP, H. C. H., & ROEPKE, M. H. (1942). **Sulfaguanidine in the Treatment of Infectious Enteritis in Swine.**—*Proc. Soc. exp. Biol., N.Y.* **50.** 268–269. **1265**

Sulphaguanidine, administered in capsule at the rate of 0·16–0·44 g. per kg. body weight daily, was found to exert a markedly beneficial effect upon clinically diagnosed " infectious enteritis " of pigs, both under controlled conditions and in the field. Smaller doses were sometimes less effective. Preliminary trials did not provide any evidence of toxicity with dosages up to 0·66 g. per kg. body weight.—A. N. WORDEN.

FEARON, W. R. (1942). **Thiourea and Wound Repair.**—*Brit. med. J.* July 25th. 95. **1266**

The application of 1% aqueous solution of thiourea to chronic ulcers (47 cases) appeared to stimulate the proliferation of granulation tissue; the optimal response was reached within 12 days.—J. M. ROBSON.

PICKRELL, K. L. (1942). **A Sulfonamide Film for Use as a Surgical Dressing. Preliminary Report.**—*Johns Hopk. Hosp. Bull.* **71.** 304–306. **1267**

Sulphonamide films were prepared by spraying on to a smooth, horizontal glass surface an emulsion containing 3% sulphadiazine or 3% sulphanilamide, 2·5% methyl cellulose, 3% triethanolamine, and 0·5% sorbitol, with 50% alcohol or acetone added to make 100 ml. When acetone is used as the drying agent, evaporation is very rapid but when 50% alcohol is used, several hours at 75°C. are required before the film can be easily removed in a single sheet. As the film retains only a slight amount of moisture it usually contains 35–50% sulphonamide.

When a segment of the film is placed beneath the skin of a rabbit, absorption takes place and sulphonamide can be detected in the blood within several hours; after 24 hours disintegration of the film is almost complete.

These films have been used with excellent results in more than 100 cases (human) half of which were burns. In the remaining cases they were used to cover recent incisions, lacerations, and abrasions; to prepare granulating areas for grafting; to cover abraded and ulcerated areas, and as a framework to hasten closure and regeneration of perforated ear drums. In 30 cases in which bacteriological examinations were carried out, no infection was observed but when low concentrations of the sulphonamides were used in the films, infection did occur. It was found that sulphadiazine films afforded greater protection against infection than sulphanilamide films.—R. ALLCROFT.

BREWER, C. M. (1942). **Use and Abuse of *Staphylococcus aureus* as a Test Organism.**—*Amer. J. publ. Hlth.* **32.** 401–405. **1268**

The comparative use is discussed of *Staph. aureus* as a test organism for methods of testing disinfectants and antiseptics. Its peculiar fitness for such purposes is conceded, especially when the selection of test organisms must be restricted to a single strain; the need, however, for the inclusion of other organisms when possible is pointed out. If *Staph. aureus* alone is used certain manipulations must be carried out meticulously and the resistance of the strain used must be carefully regulated. B. has found that variations in the meat extract content and in the surface ratio of the medium used affect this resistance considerably.

—E. J. M. HAYWARD.

ALBERT, A. (1942). **Chemistry and Physics of Antiseptics in Relation to Mode of Action.**—*Lancet.* **243.** 633–636. **1269**

The nature of the physical and chemical factors believed to be responsible for the activity of antiseptics is reviewed. Particular significance is attached to chemical activity of a very simple kind such as neutralization and ionic exchange reactions. The names "anionic" and "cationic" antiseptics are introduced to distinguish two important types of ionic agents. Anionic antiseptics are the neutral or faintly alkaline salts of acids of high molecular weight (*e.g.* mandelic acid), while cationic antiseptics are the neutral salts of bases of high molecular weight (*e.g.* acridine antiseptics). Antiseptic activity appears to increase with strength of basicity. The possibility is advanced that high surface activity is a property that promotes germicidal activity in disinfectants and is lacking in bacteriostatic agents.

—J. M. ROBSON.

See also absts. **1167** (cancer), **1177** (equine colic), **1225**, **1226** (sex hormones), **1073**, **1313**, **1314** (trypanosomiasis), **1076** (trichomoniasis), **1086** (bovine piroplasmosis), **1303** (general).

HYGIENE AND PUBLIC HEALTH

BRYAN, C. S., DEVEREUX, E. D., MALLMANN, W. L., TURNEY, G. J., BEGEMAN, L. H., & GILBERT, B. L. (1942). **Some Farm Procedures that Affect the Bacteria Count of Milk.**—*Quart. Bull. Mich. agric. Exp. Sta.* **24.** 205–210. **1270**

Samples of milk collected from healthy cows and from cows with mastitis were examined bacteriologically. Of the healthy cows only 5% yielded milk with a standard plate and microscopic bacterial count of more than 1,000 per c.c., whereas of the cows with mastitis, 70% produced milk with a count of more than 1,000 per c.c.

In herds known to be infected with streptococcal mastitis, the bacterial count of the milk was reduced by one-half to one-quarter by clipping the hair from the udder and flanks. Still more striking was the reduction in the counts which followed upon the instructing of farmers in proper methods of cleansing and disinfecting utensils.

In studies on the effects of the cooling of milk, counts were taken for 16 hours after milking, at hourly intervals, of samples stored at 40°, 50°, 60°, and 70°F. The data show that the bacteria in any milk stored at 40°F. for 16 hours do not multiply appreciably. At 50°F. no increase in bacteria occurred in "low-count" milk but in "high-count" milk a slight increase was evident. At 60°F. in the "low-count" milk, the number of bacteria tripled, but the total number was insignificant, while in "high-count" milk the count increased 50 times. At 70°F. the increase in bacteria was rapid, showing the danger of storage at this temperature for even short periods.—H. V. HUGHES.

JOHNS, C. K. (1941). **Some Aspects of the Resazurin Test.**—*Rep. N. Y. St. Ass. Dairy Milk Insp., 1941.* pp. 173–186. Discussion pp. 186–188. **1271**

A comparison is made between the methylene blue and resazurin tests for quality (cleanliness). The former does not yield a positive result with mastitis milk to the same extent as the latter; it yields a positive reaction with milk from cows in the late stage of lactation. The mechanism of the resazurin test is discussed.

—D. D. OGILVIE.

MATTICK, A. T. R., & HISCOX, E. R. (1941). **High Temperature Short Time Pasteurization. Some Annotations on the Milk (Special Designations) Regulations 1941.**—*Publ. nat. Inst. Dairy., Reading.* No. 658. pp. 9. **1272**

Attention is drawn to some of the important points which should be considered in assessing the suitability of a plant for high-temperature, short-time (H.T.S.T.) pasteurization, which has become permissible under the Milk (Special Designations) Regulations, 1941.

The combination of time and temperature (162°F. for 15 sec.) of this method of pasteurization as compared with the holder process (145°F. for 30 min.) has resulted in a narrowing of the limits of the margin of safety and this entails the use of automatic controls. This, and other technical points concerning the apparatus, are discussed. Since, under existing conditions, the plate

counts will probably be higher than normal, reliance should be placed upon the phosphatase test. The presumptive coliform test may also be used as a check on the contamination of milk after it has left the pasteurizer.
—H. V. HUGHES.

GUTIERREZ, M. (1941). **The Freezing Point of Carabao's Milk and its Use in the Detection of Added Water.**—*Acta Med. philipp.* **2.** 497–510. **1273**

The average freezing point depressions (F.P.D.) of 16 samples each of domestic buffalo's and cow's milk were found to be —0·539°C. ± 0·00097°C. and — 0·542°C. ± 0·00218°C. respectively. The F.P.D. was very nearly constant, in spite of considerable variations in the composition of the milk. It was calculated that every addition of 1% by weight of water causes a rise of 0·0057°C. and 0·0056°C. of the freezing point of domestic buffalo's and cow's milk respectively. This method is claimed to be more reliable for the detection of adulterated milk than estimation of the solids and solids-not-fat content.

DIXON, J. A. (1942). **Horse Butchery.**—*J. R. sanit. Inst.* **62.** 8–12. **1274**

D. speaks of the increased demand for horse flesh in the United Kingdom that has arisen during the war and speaks in terms of its being increasingly used for human consumption. He considers that the popular idea that horse meat is a rather unpleasant food is based on an erroneous conception. He discusses the conditions in which horse slaughter for meat should be undertaken. The work should be done in a licensed abattoir. It is important to see that hanging rails of an abattoir for horse meat are at a greater height than those used for cattle carcasses. *Ante-mortem* inspection is necessary, the animals being presented at a fixed time before they are due to be slaughtered.

D. discusses the disease conditions that must be borne in mind when inspecting horse flesh.—H. V. H.

*EMANUILOFF, I. (1941). **[Viability of Salmonella Bacteria in Meat and Milk Products].**—*Yearb. vet. med. Fac. Sofia.* **17.** 591–606. [In Bulgarian]. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 612]. **1275**

It was found that *S. paratyphi* B. and *S. typhimurium* are not definitely destroyed by temperatures usually used for roasting of the local meat pasty "Kebaptche". *S. typhi* and *S. cholerae-suis* remained active on the surface and inside the local cheese known as "Kashkaval" for 48 hours; *S. enteritidis* for 48 hours on the surface and for 96 hours inside; *S. paratyphi* B. for 134 hours on the surface and for 158 hours inside, and *S. typhi-murium* for 230 hours on the surface and 206 hours inside. In curd cheese and in brine, only *S. typhi-murium* remained viable for 48 hours, the other salmonella being destroyed within 24 hours.

The viability of salmonella in yoghurt depends on the degree of acidity. *S. typhi* and *S. cholerae-suis* tolerate acidity up to 28° Soxhlet-Henkel, and *S. enteritidis* to 48°.—A. MOLDAWSKY.

KEARNS, H. G. H. (1942). **The Control of Flies in Country and Town.**—*Ann. appl. Biol.* **29.** 310–313. **1276**

The article is written from the point of view of insects as pests to human beings, not to livestock. Details are given of how to kill such flies as *Pollenia rudis*, *Musca autumnalis*, *Pyrellia lasiophthalma*, and *Chloropisca circumdata*, *M. domestica*, *M. stabulans*, and *Stomoxys calcitrans* in buildings by spraying pyrethrum extract or one of the organic thiocyanates in kerosene or highly refined petroleum oil.

[Since some of these flies are a nuisance to stock especially where open wounds or sores are present, this method of reducing them should be kept in mind on farms.]—A. MILNE.

See also absts. **1147** (cysticercosis), **1154** (trichina inspection).

TECHNIQUE AND APPARATUS

KOCH, F. E. (1942). Elektivnährboden für Staphylokokken. **[Selective Culture Media for Staphylococci].**—*Zbl. Bakt. I. (Orig.).* **149.** 122–124. **1277**

By using a sodium chloride concentration of 15% for broth or one of 7·5% for nutrient agar, selective culture media for *Staphylococcus aureus* were devised. The growth of *Bacterium coli*, *Proteus vulgaris*, and a variety of other organisms was inhibited. Higher percentages of sodium chloride inhibited the growth of staphylococci.—D. L. ROBARTS.

*GUITTONNEAU, G., & CHEVALIER, R. (1941). Nouvelles techniques de préparation d'un milieu de culture à base de lait digéré. Le lait digéré par la papaïne. **[A Culture Medium of Papain-Digested Milk].**—*Lait.* **21.** 1–8. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 93]. **1278**

Details are given of the preparation of the medium, which resembles trypsin-digested milk; the ratio protein N : amino N : polypeptide N was 31·48 : 38·20 : 30·81 (trypsin digestion produces values of 36·81 : 38·70 : 24·47). Milk : water ratios of 1 : 3 to 1 : 6 are suitable, and powdered milk (90 g. = 1 litre milk) may be used.—J. G. CARR.

RAUCH, G. (1942). Ein Verfahren zur bakteriologischen Untersuchung flüssiger Untersuchungsstoffe. **[Method for Bacteriological Examination of Fluids].**—*Arch. Hyg., Berl.* **128.** 63–68. **1279**

R. describes a method for obtaining cultures from fluids such as water, urine, milk, and pus. 2·5 ml. of the liquid is mixed with 0·5 ml. of melted agar and poured quickly upon a cold agar plate so as to form a film-like coating. Cultures prepared in this manner are therefore on, or practically on, the surface. This is not the case with other methods in which (1) the fluid is mixed with the usual volume of agar and poured on to a plate, with the result that colonies grow deep in the medium as well as on the surface, or (2) the infected fluid is first desiccated and the resultant solid particles are sown on agar plates.

The method now described was found to yield more and larger colonies than either of the others.
—J. E.

ARCHAMBAULT, J., & MCCRADY, M. H. (1942). **Dissolved Air as a Source of Error in Fermentation Tube Results.**—*Amer. J. publ. Hlth.* **32.** 1164–1168. **1280**

The experiments described show that the solubilities of air in various broths are such that visible gas may be released when these broths are incubated at 37°C., after a previous period of storage at a lower temperature, and so vitiations of results of bacterial fermentation tests may occur. Seven days of storage of single strength lactose broth at 4°C. or even at 13°C. was sufficient to cause this. The authors advise that tubes of medium for fermentation tests should be stored at temperatures not far below 25°C., and then only for a limited period of time, and that tubes which must be stored at lower temperature should be incubated overnight before use. The factors determining the frequency with which gas bubbles may appear are discussed.—E. J. M. HAYWARD.

ROSE, H. M., & KOLODNY, M. H. (1942). **The Use of SS (Shigella-Salmonella) Agar for the Isolation of Flexner Dysentery Bacilli from the Feces.**—*J. Lab. clin. Med.* **27.** 1081–1083. **1281**

The value of SS agar (lactose, bile salt, brilliant-green, neutral-red agar) for the diagnosis of the Flexner type of dysentery is well illustrated by a study of the comparative efficiency of eosin methylene-blue agar, desoxycholate-citrate agar, and SS agar in isolating the bacilli from 70 positive stool specimens from a small outbreak of Flexner dysentery. Positive results were obtained in 40%, 86%, and 98% of cultures on the respective media. SS agar was considered superior to desoxycholate-citrate agar in the inhibition of coliform bacilli, in colony differentiation, and in growth-promoting qualities for the pathogens. For maximal efficiency of isolation, two or more plates of the selective medium with one of a suitable non-selective medium should be used.—R. O. MUIR.

MCCULLOUGH, N. B., & DICK, L. A. (1942). **A Staining Procedure for Use in the Brucella Opsonocytophagic Test.**—*Stain. Tech.* **17.** 153–155. **1282**

The stain used is the following: 0·5 g. sodium chloride, 0·5 g. phenol, 0·5 g. methylene blue (certified), 0·02 g. ($Na_2HPO_4 + 12\ H_2O$), 50 ml. distilled water, and 50 ml. methyl alcohol (absolute).

Films are prepared according to Huddleson's technique and dried rapidly to prevent distortion of cells. They are fixed for 5 min. or longer in absolute methyl alcohol (acetone free) and stained for 10–30 min., then washed gently in water and dried in air.

In the stained preparation the bacteria and nuclei of the leucocytes appear deep blue while the cytoplasm of the leucocytes is faintly green with the cell outline distinctly visible. Cytoplasmic granules do not stain. —E. J. M. HAYWARD.

MUDD, S., & ANDERSON, T. F. (1942). **Selective "Staining" for Electron Micrography. The Effects of Heavy Metal Salts on Individual Bacterial Cells.**—*J. exp. Med.* **76.** 103–108. **1283**

An explanation, on a physical basis, of contrast and image formation in electron micrography, analogous to X-ray pictures although differing in the mechanism of image formation. This is followed by an illustrated description of electron micrographs of *Fusobacterium, Salmonella typhi, Bacterium shigae,* and a species of *Vibrio,* dried from distilled water and after exposure to solutions of silver, mercury, and lead salts. Selective darkening, shrinkage, coagulation, and escape of the inner protoplasm from the injured cells is recorded in the electron micrographs. The recording of the action of germicidal agents on bacterial cells by electron micrography is exemplified as one promising field for the application of selective microchemical analysis equivalent to differential staining methods.—R. O. M.

VAJDA, T. (1940). A mételypeték kimutatása, különös tekintettel egy új dúsitási eljárásra. **[Demonstration of Liver Fluke Eggs by a New Enrichment Technique].** —*Állatorv. Lapok.* **63.** 147–149. **1284**

The author describes in detail a modification of his sodium silicate flotation method (1927), using instead crude potassium carbonate (specific gravity 1·456).—J. CSONKA.

HU, C. H., & PAI, H. C. (1942). **Use of the Supravital Staining Technic in the Study of Tumors of the Lymphosarcoma Group.**—*Arch. Path.* **34.** 106–116. **1285**

The supravital staining technique, by demonstrating finer cell structures not usually recognizable in ordinary preparations, is particularly useful in the study of blood and connective tissue cells where it enables the different cells derived from reticulum cells to be distinguished, *i.e.* histiocytes, clasmatocytes, monocytes, etc. Observations with the use of this technique were made on some tumours of the lymphosarcoma group and the pictures obtained were compared with ordinary haematoxylin-eosin specimens. The findings are described.—H. L.

SOBIN, B., & STAHLY, G. L. (1942). **The Isolation and Absorption Spectrum Maxima of Bacterial Carotenoid Pigments.**—*J. Bact.* **44.** 265–276. **1286**

Modification of some of the methods used for the separation and identification of carotenoid pigments in plants has made them available for the separation and determination of absorption spectrum maxima of similar pigments present in bacteria. The pigments were extracted with hot methanol from the bacterial cells, separated by chromatographic absorption, and subjected to spectrometric analysis.

Examination of 14 bacterial species resulted in isolation of 12 carotenoid pigments of which seven were alcohols and five hydrocarbons. Some bacteria produced only one pigment and others several, while, on the other hand, the same pigment was produced by bacteria which were distinguishable by their fermentation reactions.

Pigment analysis of 12 strains of *Staphylococcus aureus* from different sources showed that each contained two pigments whose absorption maxima coincided with those of δ-carotene and rubixanthin. There were variations with regard to a third pigment.—E. J. M. H.

HANSEN, F. L., & PERVIER, N. C. (1942). **Dehydration in Embalming Specimens exposed to Air.**—*J. Lab. clin. Med.,* **27.** 1078–1080. **1287**

It is generally stated that the use of glycerin or other polyhydric alcohols in embalming fluids retards loss of water from the subject. Experiments on pigs' kidneys using formalin with 2·5–10% glycerin or other polyhydric alcohol added gave no support to this view. Water loss from embalmed bodies cannot be prevented unless much larger amounts of hygroscopic agents are injected than is practicable.—E. G. WHITE.

VAN DE PAS, L. (1940). La diafanización de piezas anatómicas. **[Clearing of Anatomical Specimens].**—*J. agron. vet., Univ. B. Aires, 1939.* pp. 393–396. **1288**

The specimens are fixed in 10% formalin, passed through hydrogen peroxide, washed in running water, dehydrated in alcohols, and passed to benzol. They are then transferred to a bath of the final clearing fluid which varies according to the refractive index of the tissue and may be xylol, benzol, methyl salicylate, naphthol-xylol, or a mixture of these. The specimen is finally mounted in a hermetically sealed vacuum. A table is given of the refractive indexes of a number of tissues and clearing fluids.—MILLER WATSON.

PERVIER, N. C., & HANSEN, F. L. (1942). **The Measurement of Formaldehyde Fixation.**—*J. Lab. clin. Med.* **27.** 666–669. **1289**

Details are given of the construction of a portable meter for the measurement on a numerical scale of the hardness of tissues, organs, or cadavers. The instrument can be used for measuring in living bodies the changes in muscle tonus during contraction and relaxation and in tissue consistency due to the deposition of fat, and also for estimating the progress of rigor mortis in cadavers as well as the softening of tissues by putrefaction. Another application is the quantitative study of the chemical and physical factors involved in formaldehyde preservation of protein structures and the measurement of the synergic effects of various compounds used in embalming fluids.—R. O. MUIR.

KRUPSKI, A. (1942). Grundsätzliches zur Hämometerfrage. **[Fundamentals of Haemoglobinometry].** —*Schweiz. Arch. Tierheilk.* **84.** 387–390. **1290**

After a brief introduction, K. deals exclusively with various modifications of the Sahli acid-haematin method of haemoglobin estimation. He advocates the use of the original type of Sahli haemoglobinometer with its colloidal acid-haematin standard solution, as being the most generally useful and reliable instrument for haemoglobin determinations in clinical practice, and deprecates the introduction of modifications involving the use of artificial standards such as dye solutions and coloured glass discs which, he declares, considerably impair the accuracy of the original method.—J. L. McG.

HARVEY, S. C., & GARDNER, J. S. (1942). **Diethylene Glycol as a Medium for Heat Sterilization of Surgical Instruments.**—*Yale J. Biol. Med.* **14.** 547–552. **1291**

Edged instruments can be sterilized without dulling of the cutting surfaces, by immersing them in diethylene-glycol containing 10–20% water, and autoclaving.

See also absts. **1028**, **1029**, **1032-1035** (TB.), **1037** (glanders), **1116** (vaccine preservation), **1075** (cultivation of trypanosomes), **1078**, **1079** (of trichomonads), **1091** (of spirochaetes), **1140** (micro-cataphoresis), **1297** (diagnosis).

MISCELLANEOUS

—. (1942). **[Papers Presented at the Annual Meeting and Conference of the National Veterinary Medical Association of Great Britain and Ireland, September 1942].** [Speakers: CURLEY, E. M., DEVINE, B., TINNEY, H. R., HILL, J. C., BLOOD, BYWATER, H. E., EDWARDS, S. J., BAKKER, Tj., STEELE-BODGER, H. W., & LOVELL, R.]—*Vet. Rec.* **54.** 441–450 and 459–463. Discussion pp. 450–453 and 463–466. **1292**

Preceding the conference, the formation of a Veterinary Educational Trust was announced. The object of the Trust is to raise at least a million pounds. The income from this capital is to be devoted to improving and broadening educational facilities within the veterinary profession. Subsequently, the general direction of the profession towards State service through an Animal Health Corporation, under veterinary control, is envisaged.

The conference discussed two questions.

(*1*). *The Inspection and Control of Meat and Milk*

MEAT.—CURLEY dealt with the functions of the veterinary service of the U.S. army, chiefly with regard to meat inspection. Practically all products of animal origin for the army are purchased from plants operating under the control of the Bureau of Animal Industry. The products are examined by officers of the veterinary service initially and during transportation, storage, and handling. Meat, butter, cheese, milk, poultry, eggs, and marine products are inspected.

DEVINE deplored the lack of an adequate veterinary inspection service in England. The concentration of slaughter in 840 abattoirs as compared with 16,000 in peace time, afforded special opportunity for the inauguration of such a service. In order that all food animals may be inspected by veterinary meat inspectors, assisted by sanitary meat inspectors acting as detention officers, still further concentration is desirable.

TINNEY described meat inspection conditions in Australia. Generally, the position with regard to meat for home consumption is similar to that in England, but a more complete service on American lines exists for meat for export. This service is under complete veterinary control, although most of the inspection is carried out by a lay inspectorate. Results have been satisfactory.

CAMPBELL HILL set out the veterinary practitioners' point of view. He stressed the value of *ante-mortem* inspection by veterinary surgeons of animals at grading centres.

BAKKER, in the subsequent discussion, described meat inspection in Holland. By law, all inspection must be done by veterinary surgeons or under their supervision.

RUNGE discussed the position in Poland. In that country all slaughtering was centralized, and the examination of meat and meat products and the direction of abattoirs and livestock markets were exclusively in the hands of veterinarians. The examination of pork for trichinosis is compulsory, as is also the bacteriological examination of suspected meat, and there is wide use of the Freibank system.

MILK.—BLOOD reviewed the milk aspect, especially as it affects the U.S. army. Only pasteurized milk from tuberculin tested herds is used. All premises producing such milk must conform to high standards of construction and cleanliness. Regular inspections of herds and of pasteurizing plants, together with various laboratory tests, ensure that the quality of the milk is maintained.

BYWATER indicated that in Britain during the war, milk production has increased but quality has deteriorated. In his opinion, this is due mainly to ineffective legislative control of the milk supply. The creation of a central body to determine milk standards, and complete veterinary supervision of production, are required.

EDWARDS, in a comprehensive survey of the position in Britain, envisaged a veterinary service charged with the control of milk production. An officer, personally responsible for a suitable area of the country, would administer the Diseases of Animals Act, the Milk and Dairies Acts and Orders, the Attested Herd Scheme, and the National Milk Improvement Scheme. He would also co-ordinate the Survey Scheme of the National Veterinary Medical Association in his own area. A specially trained veterinary staff would undertake the clinical inspection and milk examination of dairy herds, including inspection of the premises, equipment, and personnel. An area laboratory under the direction of a veterinary bacteriologist would be an integral part of the service which, it is claimed, would effect an immediate and progressive improvement in the milk situation.

(*2*). *Preventive Medicine on the Farm*

BAKKER dealt with preventive medicine on the farm in Holland. In that country no national scheme of preventive medicine existed. Several private associations, however, possessed their own animal health services which dealt with TB., contagious abortion, mastitis, and Johne's disease. Contagious abortion was treated with a live vaccine of high virulence. On farms where the disease was established, animals were inoculated when six months old. Results were favourable. Mastitis responded variably to entozon and acriflavine autovaccination, and sulphonamides given *per os*. Disease control benefited from the enforced practice of officially recording all calves and ear-marking all pigs; disease conditions revealed P.M. could thereby be referred to the premises of origin.

STEELE-BODGER discussed preventive medicine in Britain, and elaborated the N.V.M.A. survey scheme.

LOVELL, dealing with calf mortality, gave details of the results of 27,970 bovine pregnancies in England and Wales over a period of two years. Of these, 1,530 ended in abortions, 1,231 went to term but resulted in

stillbirths, and 1,251 produced living calves which died before reaching the age of six months. The general conclusion was that 1 in 7 pregnancies fail to produce an adult animal.

In the subsequent discussion, interest was centred on the possibility of further control of swill as a preventive measure against foot and mouth disease.

—D. D. OGILVIE.

—. (1942). **The Research Council of the American Veterinary Medical Association. Its Fellowship Project and Cooperative Aims.** pp. 8. Chicago, Ill.: American Veterinary Medical Association. [8vo]. **1293**

The need for an improved technique in disease control will be increased on the re-establishment of peace when, with the return of the large numbers of American troops, increased vigilance will be necessary to prevent the introduction of foreign plagues, and when international communications will bring new disease problems affecting both men and animals. Realizing this need, the A.V.M.A. has established a council with a view to fostering research in veterinary science under intelligent direction and with ample financial support. The council aims at encouraging graduate study by veterinary students, developing more well qualified research workers and teachers in the varied fields of veterinary science, stimulating interest in, and adequate financial support of, veterinary research problems, and offering its services in the correlation of veterinary research. The members of the council are prominent workers in the various fields of veterinary science and they have been appointed for periods ranging from 1–3 years.

Industrial and commercial firms are urged to present their problems to the council with a view to providing fellowships for training purposes, obtaining qualified recipients for the fellowships, and aiding in the selection of institutions where the studies may be carried on. Contributions are invited to a general fund.

—H. V. HUGHES.

SAVELEV, G. S. (1939). Gosvetbaklaboratoriya—uchastnik vsesoyuznoĭ s.-kh. vystavki. [**The State Veterinary-Bacteriological Laboratory**].—*Sovyet. Vet.* No. 9. pp. 13–31. **1294**

The history and development of the institute which was founded in 1928, are described. Its location is not given. In the beginning the professional staff consisted of only three persons. Poultry diseases and poultry husbandry soon became the main occupation of the institute. The institute had to deal with a situation in which there was a lack of poultry husbandry experts, in which the poultry farmer was insufficiently acquainted with the problems of mass feeding and mass breeding, and in which there was an insufficient knowledge of methods and technique of incubation, etc. Improved foodstuffs were devised, a process for the artificial drying of hay was worked out, vaccines were prepared against fowl typhoid, and tuberculin was prepared. The eradication of TB. from poultry farms was successfully undertaken.—E. R. PARISER.

DAHLBERG, A. C. (1941). **Milking Machines—Their Operation and Effect upon Milk Production and Mastitis.**—*Ass. Bull. internat. Ass. Milk Dlrs.* **33.** 336–340. **1295**

Details are given of a planned experiment to test the influence of milking machines on milk production and the relationship of milking machines to the incidence of mastitis.

A comparison was made between hand milking and machine milking. Cows were bred so that calvings occurred evenly throughout the year and were milked for 10 months; they were milked by machine at 2, 3, and 5 years of age, and by hand when they were four years old. Production measured in pounds of butter fat per cow showed that the four-year-olds milked by hand produced the most. When, however, the time during which the milking machine was left on was reduced from 9 min. to 4½ min., the production improved until it was equal to that of hand milking, although it was not equal to it during the last two months of the lactation. Faster milking reduced the incidence of mastitis.—D. L. HUGHES.

TRILLAT, A. (1940). Sur le mécanisme de transmission des maladies transmissibles par l'air et sur les aérosols microbiens. [**The Mechanism of Air-Borne Infection with Remarks on Microbial Aerosols**].—*Arch. Inst. Pasteur Tunis.* **29.** 294–301. **1296**

A general lecture on the established facts of air-borne infections, their epidemiology as studied by means of artificial microbial aerosols, and their control by use of germicidal aerosols.—J. E.

SCHULZ, K. (1941). **The Value of Bone Marrow and Tail Smears in Facilitating Diagnosis in Decomposing Carcases.**—*J. S. Afr. vet. med. Ass.* **12.** 12–19. **1297**

This method of diagnosis was investigated because of the difficulty encountered with blood and organ smears from decomposed carcasses. Tail smears were first tried, but they were found to be inferior to smears from the bone marrow. It was found that with bone-marrow smears from cases of East Coast fever, a diagnosis could be made for 2–4 days after death and with tail smears for 24 hours longer than with spleen or gland smears. S. suggests that smears from the bone marrow could supersede smears from glands or the spleen in decomposed carcasses. Tail smears are of value in decomposed carcasses, but they should be taken from blood and not from serous fluid. Bone-marrow smears taken from ribs were found to be the most suitable and the most easily prepared. To make the smears, a piece of rib is excised at the chondro-costal joint of one of the last three ribs.—E. M. ROBINSON.

THOMAS, A. D., & KOLBE, F. F. (1942). **The Wild Pigs of South Africa. Their Distribution and Habits, and their Significance as Agricultural Pests and Carriers of Disease.**—*J. S. Afr. vet. med. Ass.* **13.** 1–11. **1298**

There are only two species of true wild pigs in South Africa, the bush pig (*Potamochoerus porcus koiropotamus*) and the wart-hog (*Phacochoerus aethiopicus* sub spp.), but there are some domestic pigs which have become wild and the descendants of some Bavarian wild boars introduced into the Cape. A map is given showing the distribution of the types and a considerable degree of overlapping can be noticed. The bush pig and the wart-hog have a somewhat similar distribution, but the former is more restricted and the latter far more numerous. The bush pig lives in family groups, in mountain forests, wooded kloofs or in reeds near rivers. The wart-hog inhabits light bush or thorn veld near water, feeding in the early morning and late afternoon. It sleeps in abandoned "antbear" [? aardvark] or porcupine burrows at night and breeds there. Where unprotected it is often almost exterminated by natives or animal enemies such as dogs or the large carnivores. The bush pig is the more destructive and may do extensive damage to crops or to natural vegetation. Both types are carriers of nagana and of swine fever and are important food hosts of tsetse flies. The percentage of wild pigs infected with S.F. is higher in the Northern Transvaal than elsewhere.

These wild pigs are probably of no economic value. Where their natural enemies are not controlled the wild pig population is kept well in check. Trapping or poisoning methods are not of much value in eradicating

bush pigs, organized hunts being the most effective. Wart-hogs can be easily reduced in numbers by hunting them or by gassing or shooting them in their burrows. —E. M. ROBINSON.

NASH, T. A. M. (1941). **The Anchau Settlement Scheme.**—*Fm & Forest.* **2.** 76–82. **1299**

Attempts are being made to create a tsetse-free corridor through the Anchau area of Nigeria by concentrating the population sufficiently to allow of the maintenance of clearings. It is suggested that for this purpose a concentration of 70 to the square mile is the minimum density necessary, and that the amount of land required for cultivation is about 4·3 acres per head. It is recognized that manuring is essential to maintain a zone of land round each village under permanent cultivation; without this the fallow periods in the outlying farms will become so reduced that soil impoverishment will make the villagers wish to move elsewhere. Donkeys have been introduced as a source of manure, and are increasing in numbers, and plans have been made to introduce cattle and pigs at a later date. An animal clinic has been built and is being run by the veterinary department, and it is hoped that when the confidence of the native has been won, the mortality in local livestock will be reduced.—U. F. RICHARDSON.

—. (1941). **Climate and Man. United States Department of Agriculture Yearbook of Agriculture, 1941.** pp. 1248. Washington, D.C.: U.S. Govt. Printing Office. [8vo]. **1300**

This yearbook is the sixth in an annual series designed as reference volumes for agriculturalists in the U.S.A. [see also *V. B.* **11.** 909]. It is divided into five parts. Part 1—"Climate as a World Influence"—shows how climate divides the world into regions having different kinds of natural vegetation and soils and different types of agriculture. Part 2—"Climate and Agricultural Settlement"—deals with the part climate has played in the lives of, and agricultural methods adopted by, those who settled the U.S.A. and its territories. The last two chapters of this section discuss the relation of health and disease to climate. Part 3—"Climate and the Farmer"—discusses in detail the effects of climate and weather on crops, on the problems of livestock production, soils, forestry, plant diseases, insects, and animal parasites. In Part 4—"The Scientific Approach to Climate and Weather"—the problems of floods and flood forecasting, and land use practices in relation to flood control are dealt with. Part 5—"Climatic Data"—includes many facts about climate and weather in the U.S.A., with special reference to agriculture.

Veterinarians will probably find much of interest in this book, especially the chapters entitled "Climate and Grazing", "Insects and the Weather", "Climate and Livestock Production", and "Climate in Relation to Worm Parasites of Livestock".—R. ALLCROFT.

—. (1941). **University of Pennsylvania Bicentennial Conference. The Relation of Diseases in Lower Animals to Human Welfare.** pp. 39. Philadelphia: University Pensylvania Press. [8vo] [50 cents]. **1301**

THE RELATIONSHIP OF ANIMAL DISEASES TO HUMAN WELFARE. [MOHLER, J. R.]—M. traced some of the advances in knowledge of animal diseases, especially during the 19th century. He stressed the interdependence of the medical and veterinary professions in dealing with all forms of disease and referred to the need for fostering helpful relations between professional groups. By the effective control of serious animal diseases and the skill of producers of animal food products, ample supplies had been assured for prospective needs. M. claimed that the interests of both lay and professional workers are well served by a policy of information and education on disease problems.

VETERINARY RESEARCH AND PUBLIC HEALTH. [KELSER, R. A.]—K. reviewed some of the contributions resulting from research in the veterinary field since anthrax bacilli were first observed in the blood of infected animals, referring amongst others to work on influenzal diseases, distemper, rabies, equine encephalomyelitis and brucellosis.

PROGRESS IN VETERINARY MEDICINE. [WAY, C.] —A general discussion.—C. V. WATKINS.

—. (1942). **War Medicine: a Symposium.** [Edited by PUGH, W. S.] pp. 566. New York: Philosophical Library. [42s.] **1302**

Consists of 57 special articles each dealing with a subject of importance in war medicine, such as "Healing of Wounds", "The Wounding Mechanism of High Velocity Missiles", "War Wounds", "Blast and Concussion in the Present War".

—. (1942). **War-Time Information for Pharmacists.** pp. 54. London: The Pharmaceutical Press. [8vo] [1s.] **1303**

This booklet gives useful information on changes imposed by war-time conditions on the dispensing and sale of medicines. Substitutes for drugs in short supply are suggested and a long list of useful addresses is included. Veterinary practitioners will find the booklet of much assistance.—J. E.

—. (1942). **Annual Review of Biochemistry. Volume XI.** [Edited by LUCK, J. M., & SMITH, J. H. C.] pp. ix + 736. Stanford, California: Annual Reviews, Inc. [8vo] [$5.00]. **1304**

As usual this volume maintains the high standard found in previous volumes and can be regarded as an authoritative work on recent developments in biochemistry. A wide range of subjects has been dealt with under 26 headings and although all are of comparative interest, perhaps the most useful chapters to veterinarians are those on "The Chemistry of the Hormones" by J. J. PHIFFNER and O. KAMM, "The Water-Soluble Vitamins" by P. GYÖRGY, "Fat Soluble Vitamins" by R. A. MORTON, "Nutrition" by A. G. VAN VEEN, "Avian Biochemistry" by T. H. JUKES and H. J. ALMQUIST, "Animal Pigments" by D. L. DRABKIN, "The Alkaloids" by L. C. CRAIG, "Immunochemistry" by J. R. MARRACK, and "Microbiology" by R. J. DUBOS. This last section is restricted to a discussion of bacteriostatic and bactericidal substances. —R. ALLCROFT.

HENNING, G. F., & POLING, E. B. (1941). **Motor Transportation of Livestock.**—*Bull. Ohio agric. Exp. Sta.* No. 625. pp. 49. **1305**

This is a study of the economics of the transportation of livestock by road in Ohio. The bulletin contains nothing on the zootechnical aspect.—J. E.

REPORTS

GREAT BRITAIN. (1942). **Animal Diseases Research Association, Moredun Institute. Annual Report and Accounts for 1941-42. Report of the Director of the Institute for 1941-42.** [GREIG, J. R.] pp. 16. Gilmerton, Midlothian: Moredun Institute. [8vo]. **1306**

Vaccines against LOUPING ILL, BRAXY and LAMB DYSENTERY are prepared and issued. An attempt is being made to prepare a vaccine for ewes which will result in the transmission of passive immunity to their lambs against louping-ill and PULPY KIDNEY DISEASE. It has been possible to produce SCRAPIE in sheep by

intracerebral as well as by subcutaneous infection, though the nature of the causal agent is still obscure. Work was done on staphylococcal tick-borne PYAEMIA, but no preventive or curative method was found. A test is in progress of the value of vitamin A in the diet for the prevention of CALF SCOURS; an experiment has also been begun on the use of a magnesium-rich mineral mixture for the prevention of LACTATION TETANY in cows. One type of "PINE" in sheep has been proved to be due to cobalt deficiency and is controllable by top-dressing the pastures with 2 lb. cobalt chloride per acre. This treatment was unexpectedly found to increase the molybdenum content of the pasture, and it is suggested that in cases where the Mo content of the pasture is normally high, the increase which follows Co application may reach the level which causes "teartness". Pharmacological trials with phenothiazine were conducted for the Agricultural Research Council. Reference is made to research on JOHNE'S DISEASE in sheep and to "GRASS SICKNESS".—J. E.

GREAT BRITAIN. (1942). **[Report on Work at] The West of Scotland Agricultural College [1941].**—*Trans. Highl. agric. Soc. Scot.* **54.** 144–146. **1307**

Work was done on "VINQUISH" (PINE), "HEAD GRIT", and mortality in bacon pigs.

An attempt was begun to control "VINQUISH" by manuring, mineral feeding, and individual dosing (in combination) on three hill farms. Basic slag and cobalt were used for pasture dressing, mixed minerals including Co as salt lick, and Co for direct dosage. Results are not yet available.

Mineral mixtures were also used in the hope of controlling "HEAD GRIT" (jaundice and photosensitization).

A condition of vertigo resembling Menière's disease in pigs is being investigated.—J. E.

GREAT BRITAIN. (1941). **The College of the Pharmaceutical Society. Annual Report of Research Work. 1941.** pp. 36. London: College of the Pharmaceutical Society. [8vo] **1308**

The report of the College embodies an account of the work done by the Department of Nutrition, mainly concerned with problems of vitamin assay, the Department of Pharmacology which gives an account of an investigation into the bacteriostatic action of certain acridine derivatives, and the Department of Pharmaceutical Chemistry which deals with work done on synthetic compounds with corticosterone-like activity, and synthetic oestrogens. The Pharmacology Department carried out an interesting investigation into the delay of the coagulation of blood collected in tubes made of the artificial resin "perspex" and also on the standardization of heparin.—G. D. S.

GREAT BRITAIN. (1940). **Report of the Work of the London School of Hygiene and Tropical Medicine (University of London) Incorporating the Ross Institute for the year 1939-40.** [JAMESON, W.] pp. 45. London: London School of Hygiene and Tropical Medicine. [8vo]. **1309**

Many of the activities of the school were stopped or greatly reduced owing to the war, so the report is much reduced in size.

In the Department of Parasitology, ROGERS continued biochemical research on nematodes and FENWICK completed studies on the saline requirements of *Ascaris lumbricoides* var. *suum* larvae. CLAPHAM made several observations on the poultry gapeworm and its spread among birds. PETERS and J. W. G. LEIPER worked on the improvement of faecal egg-count technique.—J. E.

SOUTHERN RHODESIA. (1942). **Report of the Director of Veterinary Research For the Year 1941.** [LAWRENCE, D. A.] pp. 8. Salisbury: Govt. Stat. Off. [fcp]. **1310**

There has been no reduction of staff, and the department's most important activities have increased considerably.

Veterinary Services.—2,819 specimens were examined for diagnosis, positive findings being:—TUBERCULOSIS 4, BLACKLEG 61, TRYPANOSOMIASIS 31, EAST COAST FEVER (*Theileria parva* INFECTION) 71, *T. mutans* INFECTION 10, GALL SICKNESS ANAPLASMOSIS 174, and canine PIROPLASMOSIS 2. 2,192 serological tests were made for CONTAGIOUS ABORTION (7·84% positive), and 2,046 blood samples were tested for *Salmonella pullorum* INFECTION and *S. gallinarum* INFECTION (seven positive).

Vaccines Issued.—Blackleg 170,805 doses, calf paratyphoid, fowl typhoid, redwater and gall sickness 1,302, African horsesickness 1,972, and fowl-pox 40,000 doses. Vaccines for bluetongue and myiasis, and various autogenous vaccines were also issued, as well as the various anthelmintics used, and trypan blue, tartar emetic, and antimosan.

Ninety cattle were immunized at the laboratory against REDWATER and GALL SICKNESS.

General Diseases.—Three bulls imported from the Union of South Africa reacted to the tuberculin test. Only two showed lesions, a single mesenteric lymph node in one and three in the other being affected. Nearly 50% of one dairy herd reacted to the test, but no tubercle bacilli were found in the milk. CONTAGIOUS ECTHYMA occurred in two dairy herds.

Pig Diseases.—Histories of MASTITIS in a few herds of pigs showed that the disease is of a "familial nature", *i.e.* it is hereditary. Treatment with sulphapyridine (M & B 693) was successful. By bringing the drug into a fine enough state to allow of a sterile suspension being injected it was found possible to treat the pigs successfully. MANGE and ASCARIASIS are prevalent. Mange is treated with lime-sulphur dip, which was also used for washing the sties. Ascariasis is treated with oil of chenopodium followed by a dose of castor oil. Trial of arecoline has shown the drug to be ineffective in pigs. Sunn hemp, *Crotalaria juncea*, in trials has not proved toxic to pigs when fed as hay, in the green state, or as seeds, either raw or when cooked.

Toxicology.—Carbon tetrachloride proved toxic to cattle receiving a diet in which the protein ratio was high. The commercial CCl_4 used had no harmful effects on cattle which were being veld fed only. Arsenic in the form of As_2O_3 was given to ducks in doses up to 2 g. in 80% solution and in pill form without causing toxic symptoms other than vomition, although traces of arsenic were found in the alimentary canal in one duck when it was destroyed 18 hours later. Copper carbonate, used in the control of the snail hosts of schistosome trematodes, proved non-toxic to cattle dosed with it. A lactating cow received 210 g. in the drinking water over a period of six days, and a calf received 20 g. and later 60 g., without ill effects.—J. A. GRIFFITHS.

NORTHERN RHODESIA. (1942). **Department of Agriculture. Annual Report for the year 1941.** pp. 6. Items of veterinary interest p. 3. Lusaka: Govt. Printer. [fcp] [1s.] **1311**

Re-settlement of natives on vacant land in order to relieve congestion in heavily populated reserves is discussed. Tsetse fly infestation is a hindrance and it would be necessary to leave all the cattle in still seriously crowded reserves, where a change from traditional to mixed farming would be possible when some dilution of the population had taken place. New settlements were to

be planned so as to act as barriers against fly encroachment.—H. E. HARBOUR.

BASUTOLAND. (1941). **[Report of] Veterinary and Livestock Division [1940-41].** [HENDERSON, G. T.] —*Rep. Dep. Agric. Basutoland, 1940–41.* pp. 8–11. **1312**

There was only one outbreak of ANTHRAX; 33,425 cattle were immunized. The widespread use of BLACKLEG vaccine is expected to diminish rapidly the losses from this disease; 14,275 animals were immunized. There were a few outbreaks of the pneumonic type of AFRICAN HORSE SICKNESS; 384 equines were immunized. All outbreaks of BLUE TONGUE were localized and the mortality was slight; 660 sheep were immunized.

The compulsory dosing of sheep and goats each month for *Haemonchus contortus* infestation was undertaken for seven months only. 7,234,608 anthelmintic doses were given to sheep, 2,488,350 to goats, 96 to cattle, and 1,037 to equines; 50,048 sheep were treated for liver fluke. 149,918 sheep and goats, 91 cattle, and 335 horses were treated for external parasites. 391 cattle were immunized against ANAPLASMOSIS. 20,377 sheep and goats, 3,028 cattle, and 1,190 horses were castrated. Expenditure on departmental services amounted to £16,297.—J. A. GRIFFITHS.

NYASALAND PROTECTORATE. (1942). **Annual Report of the Veterinary Department for the Year ended 31st December, 1941.** [WILSON, S. G.] pp. 8. Zomba: Govt. Printer. [8vo]. **1313**

General.—The department's main object has been to aid in increasing the production of food for human consumption and of other animal products of economic value. Local demands since the war have provided markets for the available output of fresh and dried meat, milk, butter, and ghee. There has also been an increased demand for hides and skins for export. 1,661 specimens were examined and many P.M. examinations were made.

Diseases.—FOWL TYPHOID is prevalent. TRYPANOSOMIASIS is still a problem in the Kasungu, Fort Manning, and Blantyre districts: in one herd where antimosan treatment failed, the use of Bayer's congasin is said to have been successful. EAST COAST FEVER (*Theileria parva* infection) is still prevalent in the valleys of the Linthipe, Diampwe, Lilongwe, and Lingadzi rivers. Dipping facilities are being improved. The disease is still enzootic in Mzimba and the Lake Shore districts of North Nyasa. A few cases of ANAPLASMOSIS and REDWATER were diagnosed. Many cases were diagnosed of PIROPLASMOSIS in dogs. Only two cases of RABIES were diagnosed, and two cases of AFRICAN HORSE SICKNESS. In North Nyasa district 30,611 cattle previously inoculated against RINDERPEST were again given glycerinated spleen-pulp vaccine; there was no mortality.

Animal Husbandry.—This is supervised by the department. It includes livestock improvement, clean milk measures, ghee production by natives, a poultry improvement scheme, marketing of animals, and preparation of all animal products.—J. A. GRIFFITHS.

UGANDA PROTECTORATE. (1942). **Annual Report of the Veterinary Department for the Year ended 31st December, 1941.** [SIMMONS, R. J.] pp. 6. Entebbe: Govt. Printer. [8vo] [Sh. 1/–]. **1314**

Trade in stock and stock products continued to improve steadily.

Sporadic outbreaks of ANTHRAX, BLACKLEG, TRYPANOSOMIASIS, and FOOT AND MOUTH DISEASE, occurred in endemic areas. An outbreak of MALIGNANT CATARRH (the first noted in Uganda) occurred in the Central District. RINDERPEST outbreaks occurred in West Nile, Teso, and Bugishu districts but were quickly stamped out by quarantine and immunization. 265,000 cattle were immunized with Kenya goat virus.

Trials of aromatic diamidines as trypanocides in cattle gave disappointing results. 4:4′-diamidino diphenylether gave good results against *Babesia canis*. It was of low toxicity for dogs and recoveries (without relapse) amounted to 100% in 39 cases. M & B 693 was found more effective than soluseptasine in canine rickettsial infection.

Detailed surveys were made of the blood changes in *Trypanosoma congolense* infections. Results are to be published later.

Tsetse-fly surveys were being made by the senior entomologist (medical). A barrier clearing of 1,100 yards in width extending for 27 miles was effective in protecting the Mbarara-Masaka road, but its upkeep was very expensive. Appearance of sleeping-sickness of the *Tryp. rhodesiense* type in South Busoga would urgently necessitate further surveys, as there was grave risk of spread.

Dried RINDERPEST virus survived for 3–4 weeks at room temperature, but remained virulent for at least a year when kept at 0°–10°C. Further attempts to produce infection in mice and rats met with no success. A susceptible bush-buck (*Tragelaphus sylvaticus*) kept in close contact with cattle reacting to goat virus did not show symptoms of rinderpest.

Various routine laboratory examinations are summarized.

The report concludes with notes on animal husbandry, ghee and butter production, pig breeding, stock markets, and hides and skins.—H. E. HARBOUR.

ZANZIBAR PROTECTORATE. (1941). **Annual Report on the Department of Agriculture for the year ended 31st December, 1941.** pp. 4. Items of veterinary interest p. 3. Zanzibar: Govt. Printer. [fcp] [50 cents]. **1315**

Attention has been given to the question of the expansion of the cattle industry with a view to improving nutrition by increasing meat and milk supplies and also to providing organic manure for the plantation industries. EAST COAST FEVER is known to be enzootic but its importance to the cattle industry is not yet known.

One case of TUBERCULOSIS occurred in a bovine; it is the first recorded. Tuberculin tests are being carried out. 11,079 vaccinations against FOWL TYPHOID were made. 228 castrations were done. Female cattle under three years old, pregnant cows, and cows producing milk may not legally be slaughtered.—J. A. GRIFFITHS.

TRINIDAD AND TOBAGO. (1942). **[Report of Senior] Veterinary [Officer, 1941].** [METIVIER, H. V. M.] —*Adm. Rep. Dir. Agric. Trin. Tob., 1941.* pp. 12–13. **1316**

Among the notifiable diseases, there were two cases of ANTHRAX; three cases of TUBERCULOSIS were found in slaughter cattle besides 33 tuberculin reactors; there was an extensive outbreak of SWINE FEVER; there was no case of RABIES, either ordinary or bat transmitted; the danger of spread of EQUINE ENCEPHALOMYELITIS from the mainland to the colony became more remote as it had been absent from Venezuela for over a year.

In dealing with unnotifiable diseases, reference is made to one case of bovine PIROPLASMOSIS, a few cases of respiratory infection in imported equines, and to the use of phenothiazine in horses, cattle, sheep, and goats. —J. E.

EGYPT. (1942). **Veterinary Service Annual Report 1936-1937.** [FARID, A.] pp. 75. Cairo: Govt. Press. [8vo] **1317**

VETERINARY LABORATORY [EL-KIRDANY BEY]—During the year specimens from 13,321 animals were

examined in the veterinary laboratory. Positive results were obtained in 2,314 cases. In addition, the laboratory examined 153 specimens of vaccines and sera; all were satisfactory. Haemorrhagic septicaemia serum and vaccine, fowl cholera, fowl diphtheria and fowl pox vaccines, tetanus serum, *Streptococcus equi* serum, mallein, and tuberculin continue to be produced and distributed from the laboratory. Observations were made on *Trypanosoma theileri* in the blood of Egyptian cattle, and on PSEUDO-TUBERCULOSIS of animals.

SERUM INSTITUTE [GUINDI, M.]—The biological products listed above were prepared in the Serum Institute. The chief activity was increased production of cattle plague serum. At the end of the year 168,457 doses of serum were available.

ANIMAL BREEDING SECTION [SOLEIMAN, R. G.]—With the object of improving native herds, the animal breeding station continued to breed and register pedigree animals. Holstein cattle were introduced for milk production. For dual purpose animals, Hungarian bulls were crossed with native Baladi cows.

POULTRY BREEDING SECTION [EL-DINE]—The poultry section was concerned chiefly with the selection of breeds of poultry suitable for the country. The acclimatization of imported breeds of poultry was also studied.—D. D. OGILVIE.

U.S.A. (1941). **Report of the Secretary of Agriculture 1941.** pp. 245. Items of veterinary interest pp. 211–215 and 236. Washington, D.C.: Superintendent of Documents. [8vo] [25 cents]. **1318**

In this general survey of agriculture in the U.S.A. in 1941, brief reference is made to highlights in advances in animal disease control [which are described in detail in the report of the Bureau of Animal Industry—*V. B.* 13. 148].—J. E.

U.S.A. (1941). **Report of the Chief of the Bureau of Dairy Industry, 1941.** [REED, O. E.] pp. 51. Washington, D.C.: Superintendent of Documents. [8vo] [10 cents]. **1319**

This report reviews the year's work and research on agricultural questions. The section on nutrition and physiology contains miscellaneous information on matters of interest to veterinarians concerned with dairy cattle, *e.g.* physiology of reproduction and lactation, vitamin requirements, etc. Outstanding animal disease subjects are referred to briefly.—J. E.

TUNIS. (1940). Fonctionnement des services de l'Institut Pasteur pendant l'année 1939. [**Work of the Pasteur Institute, Tunis, during 1939**]. [BURNET, E.]—*Arch. Inst. Pasteur Tunis.* **29.** 324–342. **1320**

Veterinary work done is reported statistically in tables dealing with diagnostic examinations and the manufacture of biological products. The human medicine section contains records of actual and suspected cases of human RABIES, with data on the animal agent concerned.—J. E.

BELGIAN CONGO. (1940). Rapport sur l'hygiène publique au Congo Belge pendant l'année 1940. [**Report on Public Health, Belgian Congo, 1940**]. [VAN HOOF, L.] pp. 107. Item of veterinary interest p. 54. [fcp] [Mimeographed]. **1321**

No case of RABIES was notified by the government medical services, but rabies in dogs occurs throughout the colony. In some parts jackals are regarded as vectors. Vaccine is prepared by Fermi's method in sufficient quantities in the laboratories. Studies on the dog virus made at Coquilhatville, Blukwa, Mongbwalu, and Stanleyville, have confirmed the identity of the viruses.

BOOK REVIEWS

PINEY, A. [M.D., M.R.C.P., Physician, St. Mary's Hospital for Women and Children, London]. (1942). **Synopsis of Blood Diseases.** pp. ix + 120. 4 plates. London: William Heinemann (Medical Books) Ltd. [8vo] [10s. 6d.] **1322**

As the author states in his preface, this book has been written for the general medical practitioner and the senior student who have not the time or the inclination to study the details of haematology. Each condition is considered briefly under the following headings:—symptoms, blood findings, pathology, and treatment. Nearly all the blood dyscrasias are mentioned. There are a few coloured plates giving an impressionistic picture of the essential features of the different types of blood cells, without giving exact details. Within the limitations imposed by the author, the book gives an outline of the diseases of the blood.—D. L. HUGHES.

ROSENBERG, H. R. [Sc.D.]. (1942). **Chemistry and Physiology of the Vitamins.** pp. xix + 674. 25 figs. 1 appendix. New York, N.Y.: Interscience Publishers, Inc. [8vo] [$12.00]. **1323**

In his preface, the author of this monograph explains that his original intention had been to write a combined account of the chemistry and physiology of vitamins and hormones, but that the vast accumulation of knowledge in the past ten years has caused him to limit his subject to the vitamins. Even in this field the amount of data is such as to make it almost impossible for one author to make an adequate survey. With a chemically biased author, as in this case, the chemical side of the vitamin story has received greater attention than the physiological, but a great many facts have been collected and discussed under carefully arranged headings so that it is easy to find the information one requires on any point by use of the table of contents and the author and subject indexes.

The opening chapter defines the nature of vitamins and discusses the general history of their discovery, identification, and nomenclature. All vitamins so far discovered are listed and some account is given of the means of isolating and examining the chemical constitution of vitamins and also of industrial methods of preparation. The specificity of different vitamins, chemical and biological methods of estimating them, and their physiological and pathological action are discussed. This plan is followed in each chapter on the separate vitamins, which are treated in alphabetical order. The non-identified vitamins, such as vitamins B_3, B_4, J, and L, are considered in a separate chapter with a brief account of such facts as have been published about them.

An appendix deals with a number of substances which the author terms "vitagens". These include the essential fatty acids, aminoacids, carbohydrates and sulphur compounds, as well as choline and related compounds.

An interesting and unusual source of information is provided in an index of U.S., British, German, French, and a few other foreign patents concerned with the manufacture of vitamins and vitamin products.

The book should be useful for reference especially on the chemical nature of vitamins, and the work is very fully documented with references given as footnotes but adequately indexed under authors.—A. M. COPPING.

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